

TRADE TRAINING II-III TTC PROGRAMME



TURNER



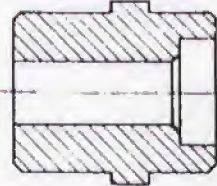
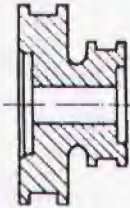

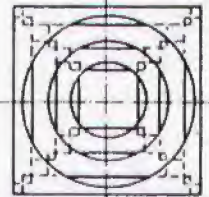
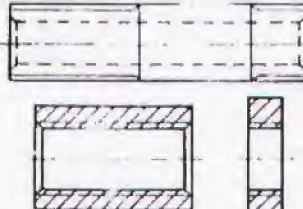
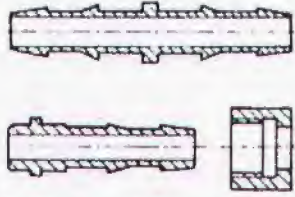
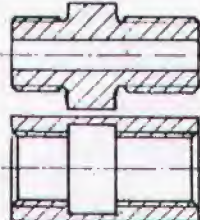
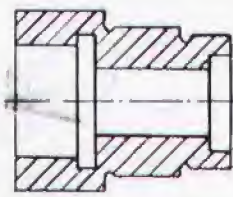
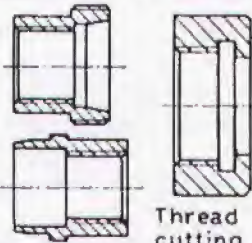
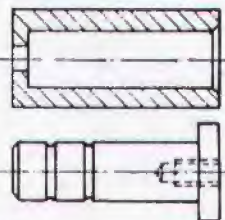
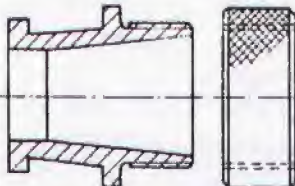

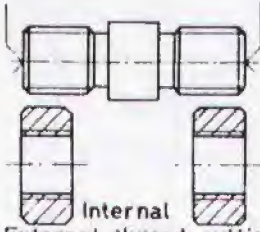

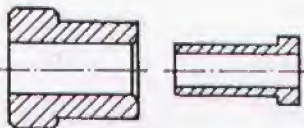
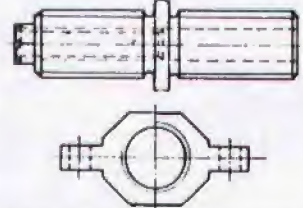
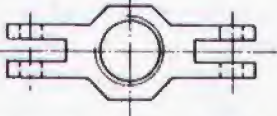
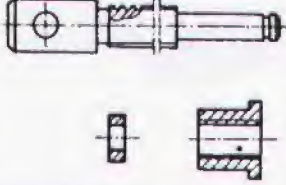


GOVERNMENT OF THE PUNJAB
TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY
TRADE TESTING BOARD
DEVELOPMENT CELL LAHORE



T.T.P. Series No.25

Price Rs.45.00

			
Longitudinal turning 1	Turning between Centres 2 → 4.2.2/2	Drilling, Reaming 3 → 13	Drilling, Grooving 4
			
Longitudinal and Taper turning 5 → 4.2.1/9	Internal turning 6	Thread cutting 7	Turning of Brass 8
			
Thread cutting 9	Step turning 10	Thread cutting 11	Fitting 12
			
Internal taper turning 3 → 13	Knurling, Longitudinal turning 14 → 4.2.2/5	Internal & External thread cutting 15	Thread cutting, Work with steadyrest 16 → 3.3.1/2
			
Bush fitting 17	Left hand thread cutting 2.3.6/5 → 18 → 3.3.1/2	Internal Acme thread cutting 3.2.1/3 → 19 → 3.3.1/2	Test piece 20 → 4.3.2/1

In addition to the exercises shown above, the trainees have to make parts which are needed for the training centre.

TRADE
TRAINING II

LAYOUT

MP/2.1/3.11

TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

MATERIAL REQUIRED

TURNER

TRADE TRAINING-II

TURNING II

No.3.1.1./1to20

Exercise No (Length given in Millimeter)																	Length per trainee	Total Length for 16 trainees	Total weight for 16 trainees																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
1																	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
MILDSTEEL ϕ 38mm 1 1/2" DIA	156																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												

Continued



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

MATERIAL REQUIRED

TURNER

TRADE TRAINING II

TURNING II

No.3.1.1/8to13

Exercise No. (Length given in millimeter)

	8.1	8.2	8.3	9.1	9.2	10	11.1	11.2	11.3	12.1	12.2	13.1	13.2	Length per trainee	Total length for 16 trainees	Total weight for 16 trainees
BRASS ϕ 16mm 5/8" DIA	56													56 mm	0.9meter	1.42 kg
BRASS ϕ 25mm 1" DIA		21												21 mm	0.34meter	1.36 kg
BRASS ϕ 14mm 9/16" DIA			81											81 mm	1.3meter	1.57 kg
MILD STEEL ϕ 32 mm 1 1/4" DIA				56	56				35					147mm	2.35meter	14.83kg
M.S. ϕ 51mm 2" DIA						63	26				56	26		171mm	2.74meter	43.6 kg
M.S. ϕ 38mm 1 1/2" DIA								31						31 mm	0.5 meter	4.45 kg
M.S. ϕ 28mm 1 1/8" DIA										61	61			122mm	2meter	9.66 kg

Continued



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

MATERIAL REQUIRED

TRADE TRAINING II

TURNER

TURNING II

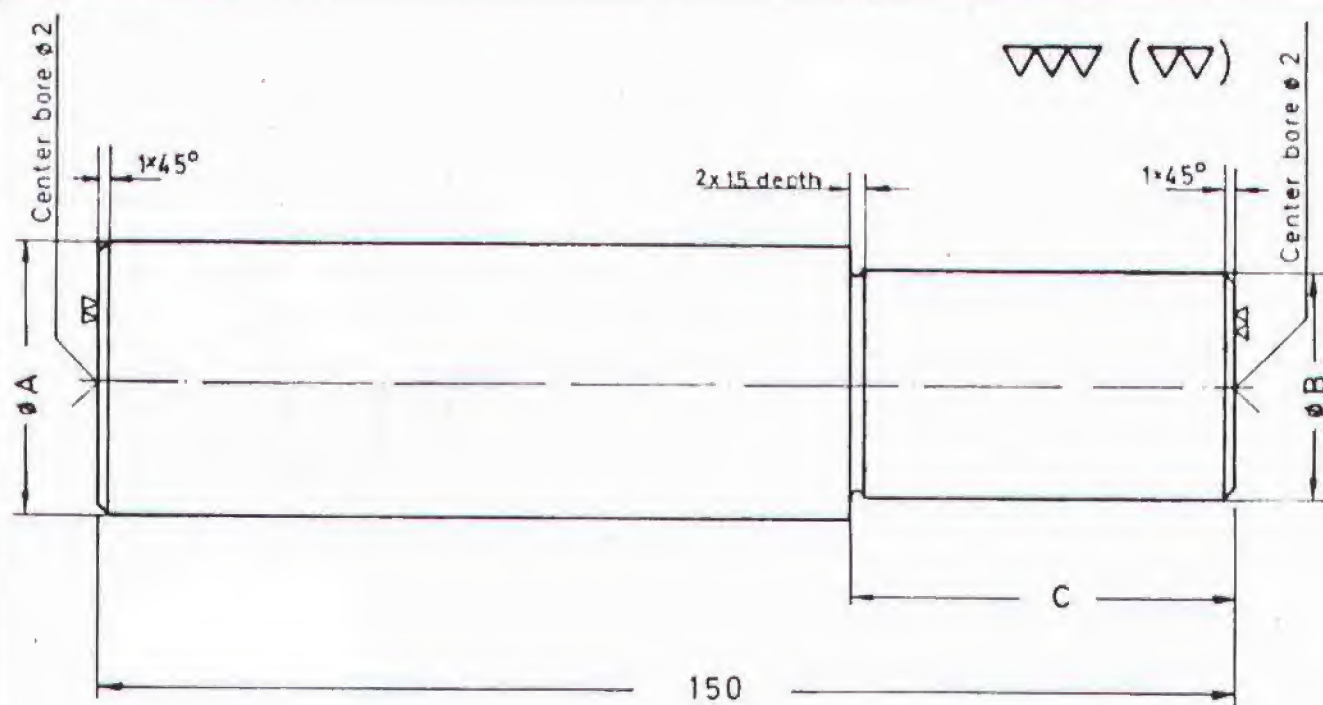
No. 3.1.1/14to20

Exercise No. (Length given in Millimeter)		Length per trainee										Total length for 16 trainees	Total weight for 16 trainees	
141 142 143 151 152 153 16 171 172 181 182 19 201 202 203														
M.S. ROUND ϕ 22mm 7/8" DIA	120										270	390 mm	6.24 meter	18.6 kg
M.S. ROUND ϕ 32mm 1 1/4" DIA	21	24	96									141 //	2.3 //	14.5 //
M.S. ROUND ϕ 50mm 2" DIA				25	25			56				106 //	1.7 //	27.2 //
M.S. ROUND ϕ 28mm 1 1/8" DIA						335						335 //	5.36 //	25.9 //
M.S. ROUND ϕ 75mm 3" DIA								57				57 //	0.91 //	32.2 //
M.S. ROUND ϕ 38 mm 1 1/2" DIA									121			121 //	1.94 //	17.3 //
M.S. FLAT 38x19mm 1 1/2" x 3/4"										82		82 //	1.3 //	7.3 //
M.S. FLAT 38x25mm											106	106 //	1.7 //	13 //
												30 8 38 //	0.61 //	4 //



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME



Exercise No	ϕA	ϕB	C	Marks given
1.1	$36 \pm 0,2$	$30 \pm 0,2$	$50 \pm 0,2$	
1.2	$32 \pm 0,1$	$26 \pm 0,1$	$52 \pm 0,1$	
1.3	$30 \pm 0,1$	$24 \pm 0,1$	$54 \pm 0,1$	
1.4	$26 \pm 0,1$	$21 \pm 0,1$	$56 \pm 0,1$	

SCALE 1:1

MAT: MILDSTEEL

MEASURING EXERCISE

MP/23/ 3.1.1/1

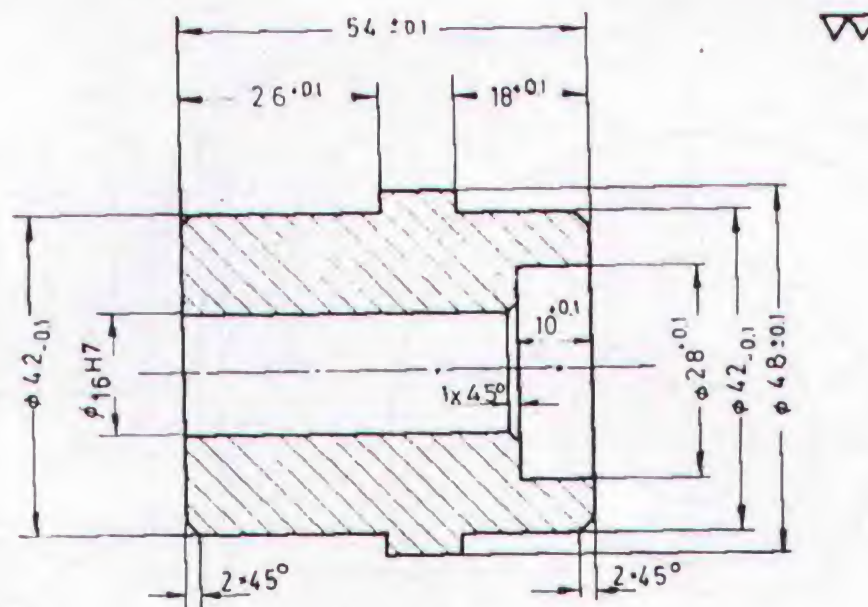
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. $54 \begin{smallmatrix} + \\ - \end{smallmatrix} 0.1$
2. $\varnothing 48 \begin{smallmatrix} + \\ - \end{smallmatrix} 0.1$
3. $\varnothing 42 - 0.1$
4. $\varnothing 42 - 0.1$
5. $\varnothing 28 + 0.1$
6. $26 + 0.1$
7. $18 + 0.1$
8. $10 + 0.1$
9. Smoothness of bore
10. Smoothness all over

The shoulder in the bore must be in right angle !

SCALE 1:1

MAT: MILDSTEEL

BUSH

MP/23/ 3.1.1/ 3

TURNING II

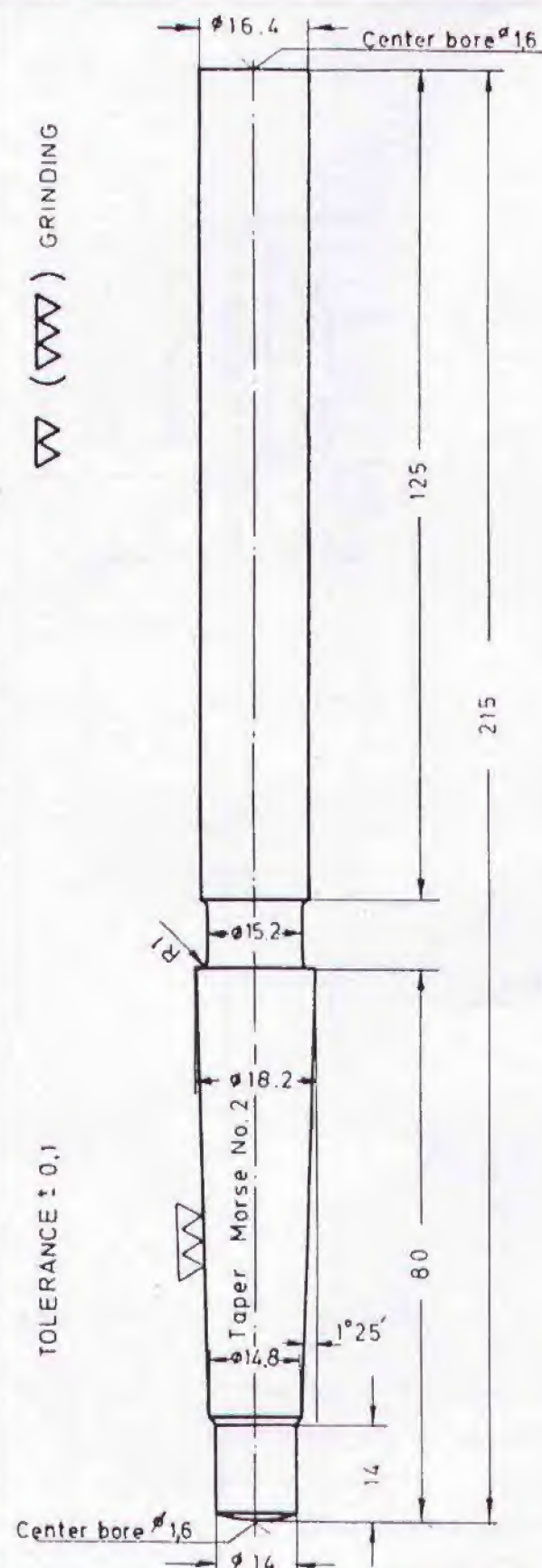


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER





CHECK THE FOLLOWING POINTS VERY CAREFULLY

- | | | |
|----|--------|------|
| 1. | ϕ | 16.4 |
| 2. | ϕ | 18.2 |
| 3. | | 125 |
| 4. | | 80 |
| 5. | | 14 |

Use the Taper gauge to check the taper Morse No. 2

SCALE 1:1

MAT. HIGH SP. ST.

DRILL BODY

MP/23/ 3.1.1/5

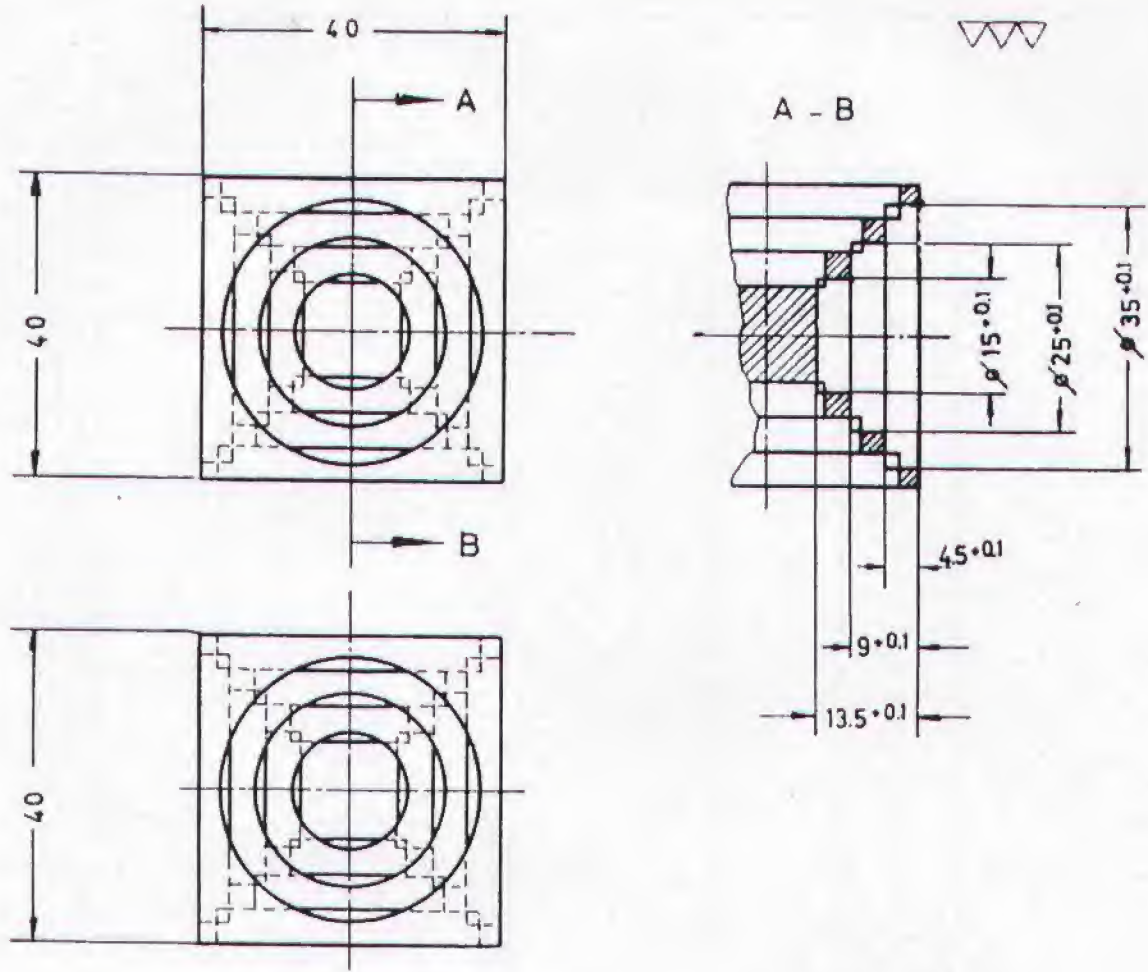
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. $\varnothing 35 + 0.1$
2. $\varnothing 25 + 0.1$
3. $\varnothing 15 + 0.1$
4. $13.5 + 0.1$
5. $9.0 + 0.1$
6. $4.5 + 0.1$
7. Smoothness of stepped hole 35 mm
8. Smoothness of stepped hole 25 mm
9. Smoothness of stepped hole 15 mm
10. Smoothness all over

Use a suitable filling disc when chucking the ready machine side !

SCALE 1:1

PAPER WEIGHT

MP/23/ 3.11/6

MAT: MILDSTEEL

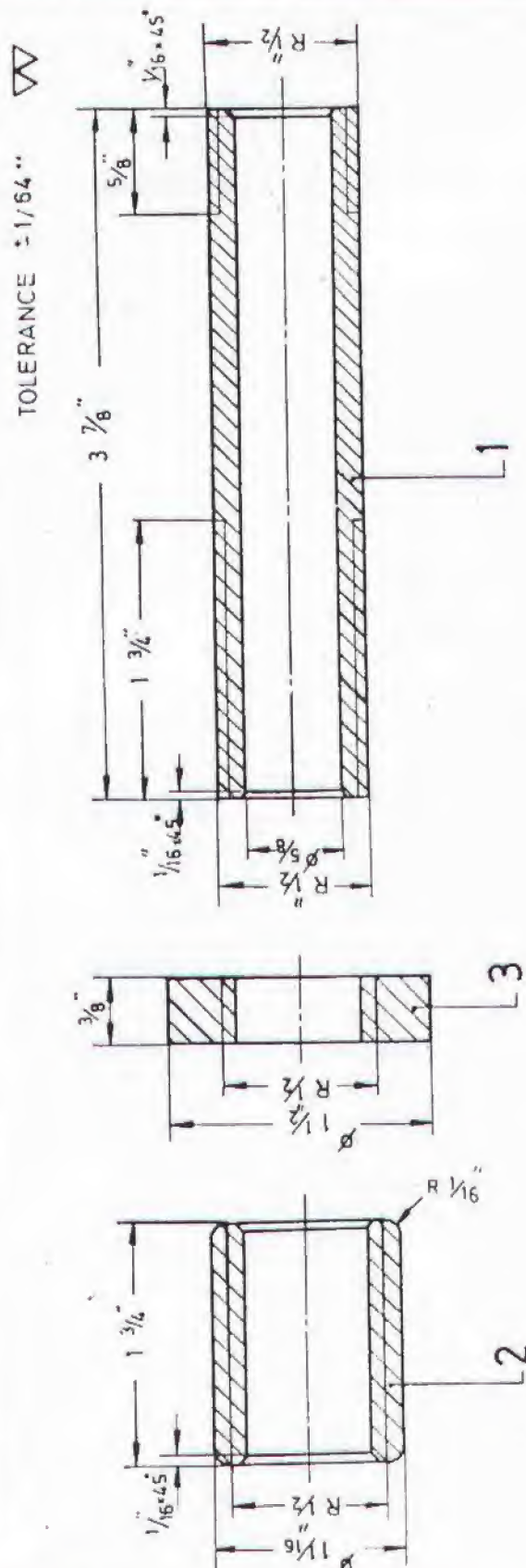
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

- | | | | |
|---------------------------------------|--------------------|---|-----------------|
| 1. Smoothness pipe thread | R 1/2 " x 1 3/4 " | - | Piece No. 1 |
| 2. Smoothness pipe thread | R 1/2 " x 5/8 " | - | Piece No. 1 |
| 3. Smoothness drilled hole | Ø 5/8 " | - | Piece No. 1 |
| 4. Smoothness pipe thread | R 1/2 " x 1 3/4 " | - | Piece No. 2 |
| 5. Smoothness outside diameter | 1 1/16 " x 1 3/4 " | - | Piece No. 2 |
| 6. Accuracy of pipe thread connection | R 1/2 " | - | Piece No. 1 + 2 |
| 7. Smoothness pipe thread | R 1/2 " x 3/8 " | - | Piece No. 3 |
| 8. Smoothness of faces | | - | Piece No. 3 |
| 9. Accuracy of pipe thread connection | R 1/2 " | - | Piece No. 1 + 3 |
| 10. Smoothness and accuracy all over | | - | Piece No. 1 + 3 |

Prepare parts 2 and 3 first and check part 1 with their help !

SCALE 1:1

MAT: MILDSTEEL

PIPE LONG - THREADING

MP/23/ 3.1.1/7

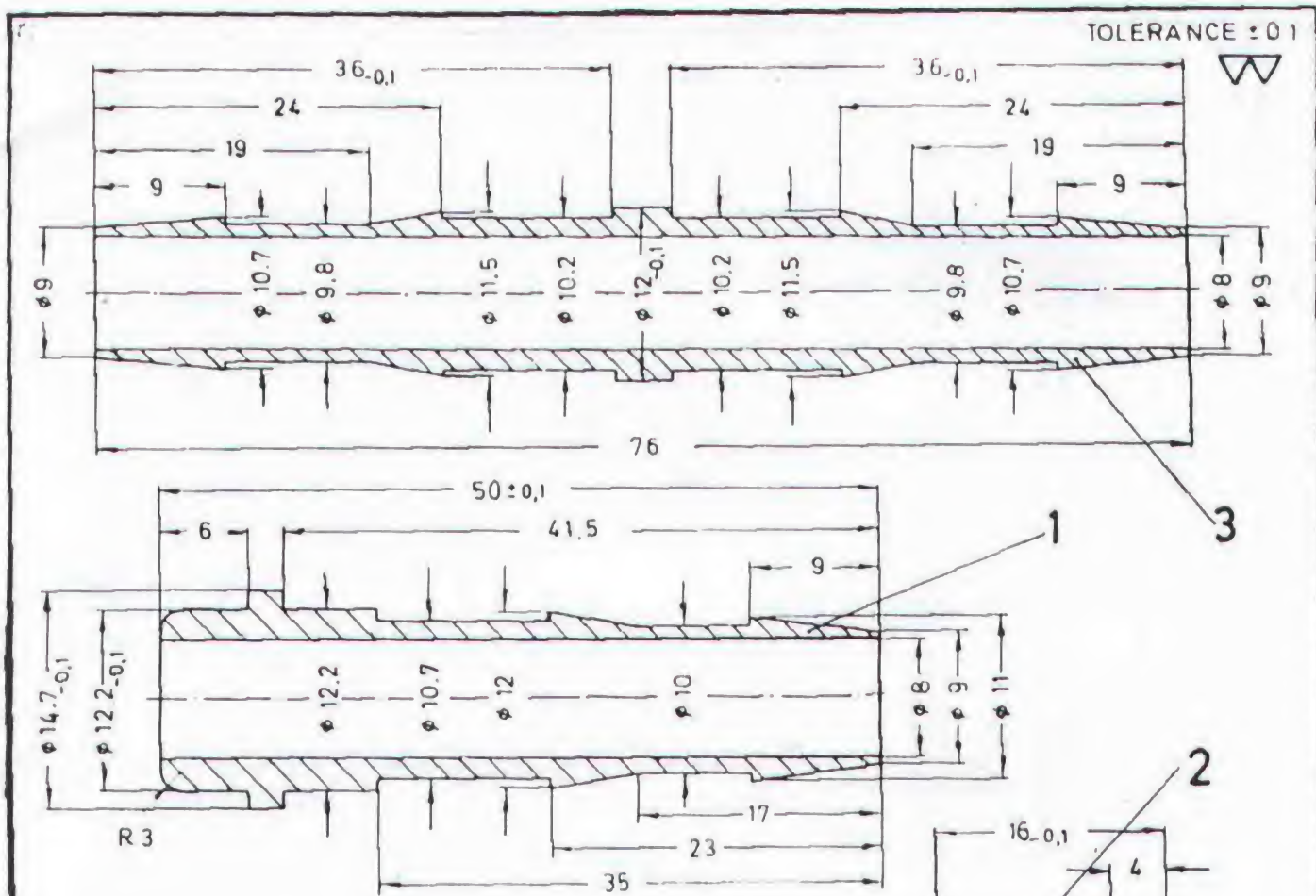
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

FAK GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

- | | | | |
|-----|--------------------------------------|-----------|---------------|
| 1. | 50 | ± 0.1 | - Piece No. 1 |
| 2. | ϕ 14.7 | - 0.1 | - Piece No. 1 |
| 3. | ϕ 12.2 | - 0.1 | - Piece No. 1 |
| 4. | 16 | - 0.1 | - Piece No. 2 |
| 5. | ϕ 22 | - 0.1 | - Piece No. 2 |
| 6. | ϕ 12.8 | + 0.1 | - Piece No. 2 |
| 7. | 38 | - 0.1 | - Piece No. 3 |
| 8. | 38 | - 0.1 | - Piece No. 3 |
| 9. | ϕ 12 | - 0.1 | - Piece No. 3 |
| 10. | Smoothness all over- Piece No. 1 - 3 | | |

Mind that the cutting angles for brass differ from those for steel !

SCALE 1:1

MAT BRASS

RUBBER PIPE CONNECTION

MP/2.3/3.1.1/8

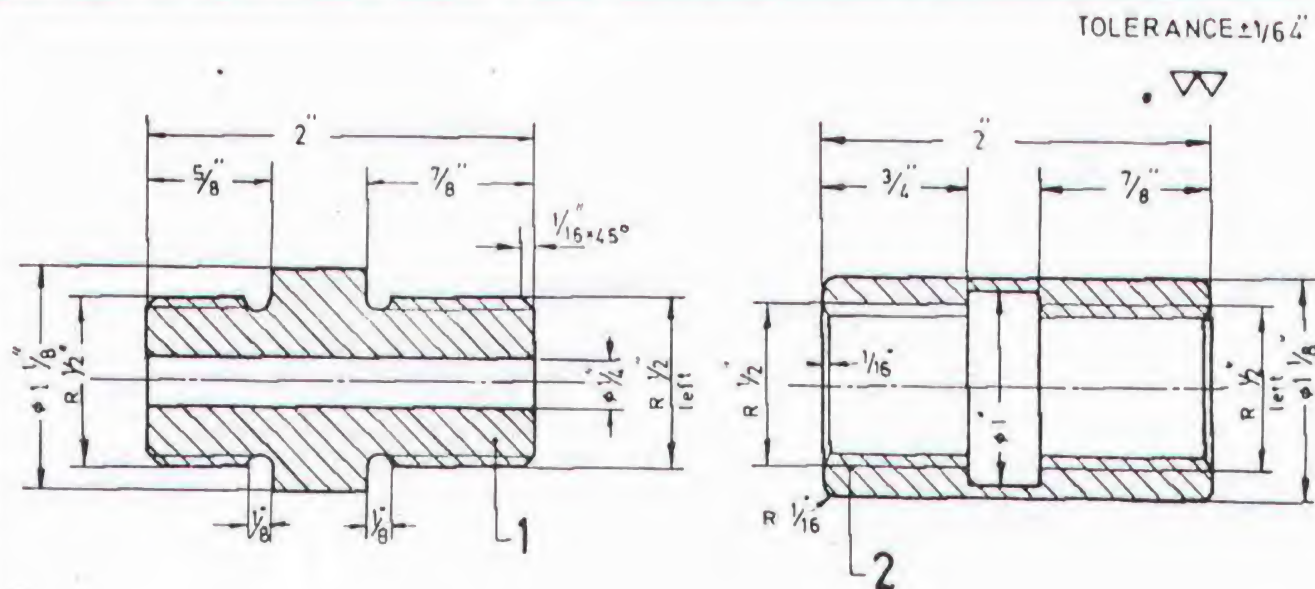
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

- | | |
|----------------------------------|--------------------------------|
| 1. Smoothness pipe thread | R 1/2" x 7/8" - Piece No. 1 |
| 2. Smoothness pipe thread | R 1/2" x 5/8" - Piece No. 1 |
| 3. Smoothness drilled hole | ϕ 1/4" - Piece No. 1 |
| 4. Smoothness of faces | - Piece No. 1 |
| 5. Smoothness pipe thread | R 1/2" x 7/8" - Piece No. 2 |
| 6. Smoothness pipe thread | R 1/2" x 3/4" - Piece No. 2 |
| 7. Smoothness outside diameter | 1 1/8" - Piece No. 2 |
| 8. Smoothness of face and radius | - Piece No. 2 |
| 9. Accuracy of connection | R 1/2" right - Piece No. 1 + 2 |
| 10. Accuracy of connection | R 1/2" left - Piece No. 1 + 2 |

Mind the left hand and right hand threads on both workpieces !

SCALE 1:1

MAT. MILDSTEEL

DOUBLE NIPPLE AND SOCKET

MP/23/ 3.1.1/9

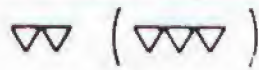
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

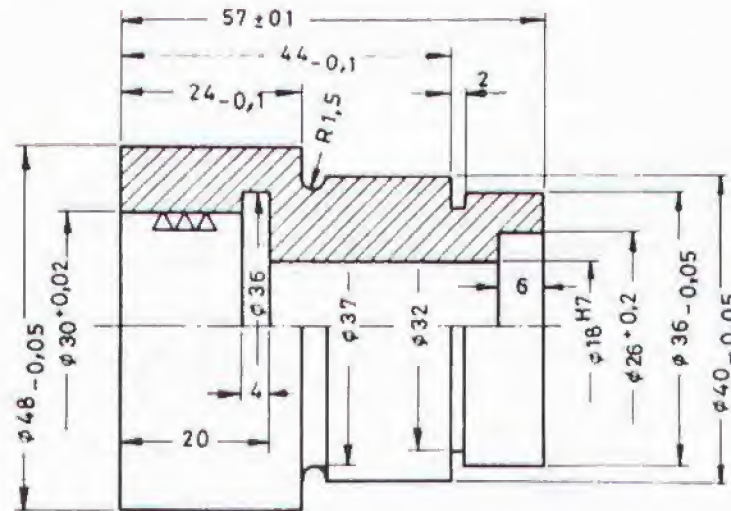
PAK GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Tolerance $\pm 0,1$
unless otherwise stated

16



SEQUENCE OF OPERATION

1. Clamp the workpiece in the chuck, drill and bore (ream) the holes 18H7 and $\phi 30 + 0.02$. Prepare the internal recess $\phi 36$.
2. Turn the diameter $48 - 0.05$ roughly (48.5).
3. Clamp on rough turned diameter 48.5 and check for true running, then bore $\phi 26 + 0.2$.
4. Hold the workpiece on a mandrel and finish the outside diameters and grooves according to the drawing.

Check the recess in the bore with spring caliper.

SCALE 1:1

MAT. MILD STEEL

STEPPED BUSH

MP/2.3/3.1.1/10

TURNING 11

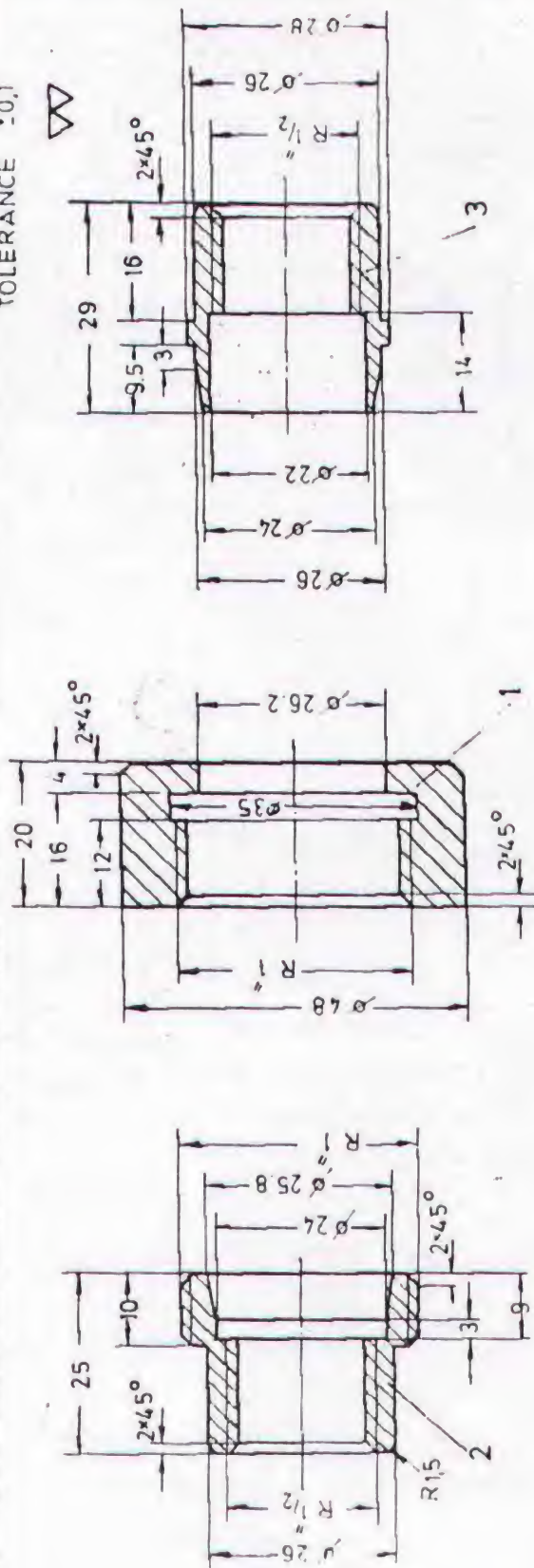


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

TOLERANCE ± 0.1



Material : Mild - steel

CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. Smoothness pipe thread R 1 " x 12
2. Smoothness pipe thread R 1 " x 10
3. Smoothness pipe thread R 1/2 " x 16
4. Smoothness pipe thread R 1/2 " x 15
5. Accuracy of pipe thread connection R 1"
6. Accuracy of taper fit
7. Accuracy and smoothness all over
8. Accuracy and smoothness all over
9. Accuracy and smoothness all over
10. Accuracy and smoothness all over

- Piece No. 1
- Piece No. 2
- Piece No. 2
- Piece No. 3
- Piece No. 1 + 2
- Piece No. 2 + 3
- Piece No. 1
- Piece No. 2
- Piece No. 3
- Piece No. 1 - 3

Complete part 1 first and cut the 1" thread on part 2 to fit with it !

SCALE 1:1

MAT: MILDSTEEL

UNION NUT

MP/2.3/ 3.1.1/11

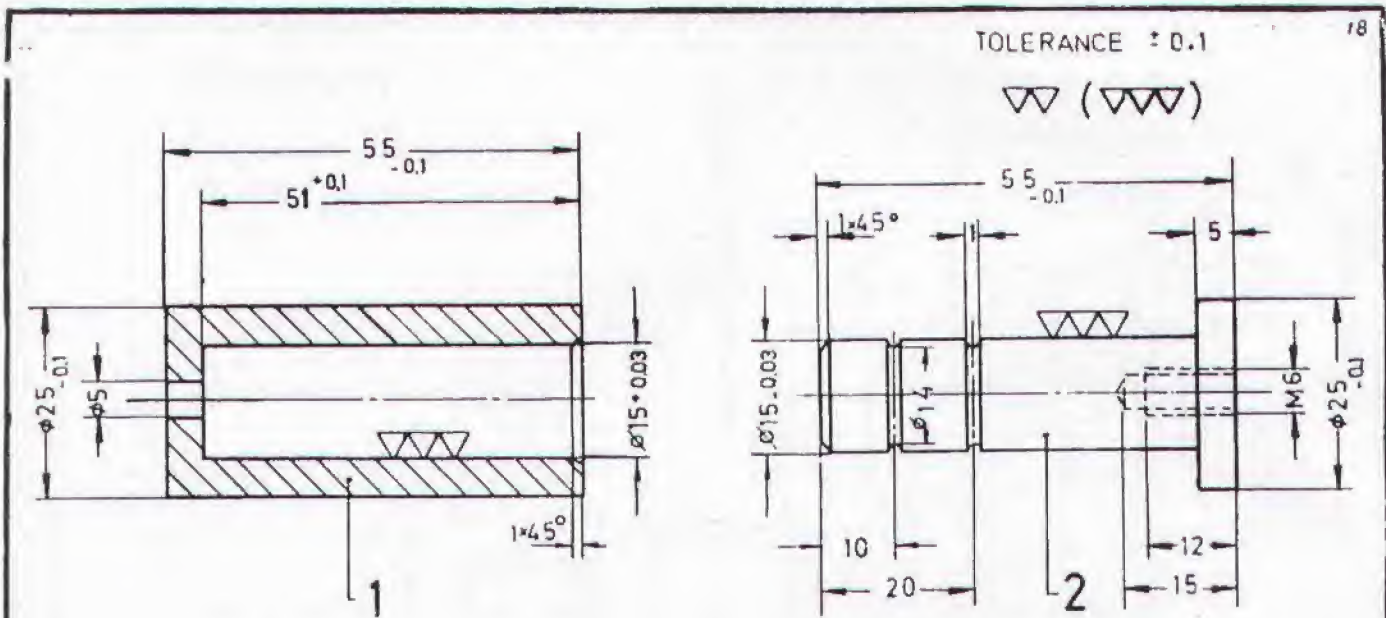
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

- | | | |
|-----|------------------------------------|-------------------|
| 1. | 55 - 0.1 | - Piece No. 1 |
| 2. | 51 + 0.1 | - Piece No. 1 |
| 3. | $\phi 25 - 0.1$ | - Piece No. 1 |
| 4. | $\phi 15 \pm 0.03$ | - Piece No. 1 |
| 5. | 55 - 0.1 | - Piece No. 2 |
| 6. | $\phi 25 - 0.1$ | - Piece No. 2 |
| 7. | $\phi 15 \pm 0.03$ | - Piece No. 2 |
| 8. | Accuracy and smoothness of notches | - Piece No. 2 |
| 9. | Accuracy of bolt connection | - Piece No. 1 + 2 |
| 10. | Smoothness all over | - Piece No. 1 + 2 |

Check the compression of the unit by closing the $\phi 5$ mm hole with the finger-tip !

SCALE:1:1

PLUNGER AND ZYLINDER

MP/23/ 3.1.1/12

MAT:MILDSTEEL

TURNING II



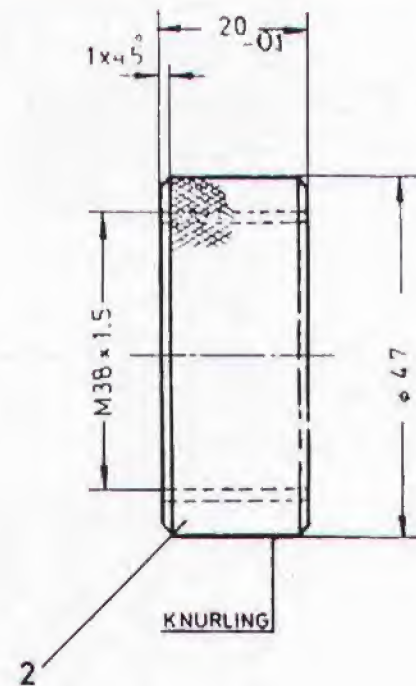
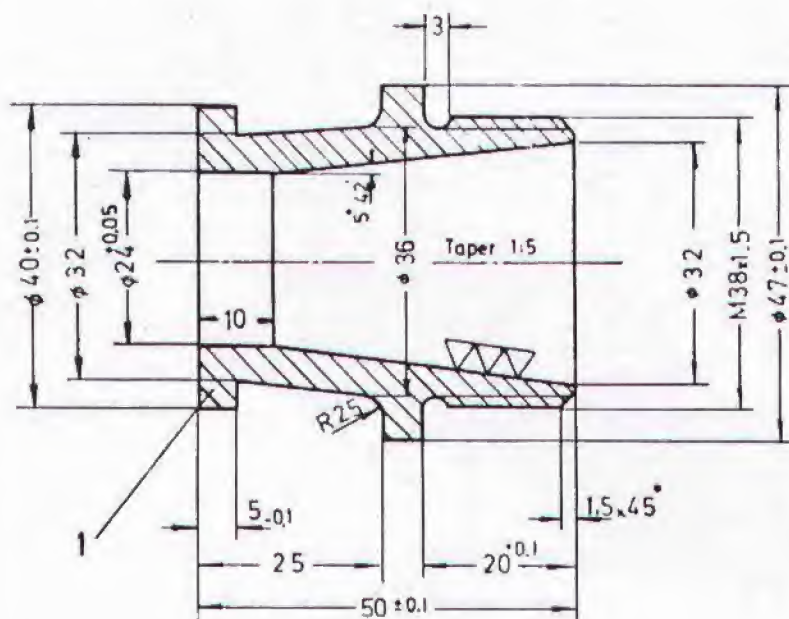
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

TOLERANCE ± 0.2

∇ ($\nabla\nabla$)



CHECK THE FOLLOWING POINTS VERY CAREFULLY

- | | |
|---|-----------------|
| 1. 50 \pm 0.1 | - Piece No. 1 |
| 2. ϕ 47 \pm 0.1 | - Piece No. 1 |
| 3. ϕ 40 \pm 0.1 | - Piece No. 1 |
| 4. ϕ 24 + 0.05 | - Piece No. 1 |
| 5. Accuracy of fine pitch thread M 38 x 1.5- | Piece No. 1 |
| 6. Accuracy of taper 1 : 5 | - Piece No. 1 |
| 7. Smoothness all over | - Piece No. 1 |
| 8. Accuracy of fine pitch thread M 38 x 1.5- | Piece No. 2 |
| 9. Accuracy and smoothness all over | - Piece No. 2 |
| 10. Accuracy of thread connection M 38 x 1.5- | Piece No. 1 + 2 |

Check the taper with a taper gauge !

SCALE 1:1

MAT: MILDSTEEL

TAPERBUSH WITH RINGNUT

FROM EX-3

MP/2.3/3.1.1/13

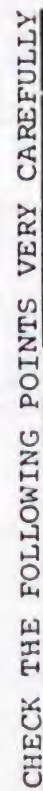
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

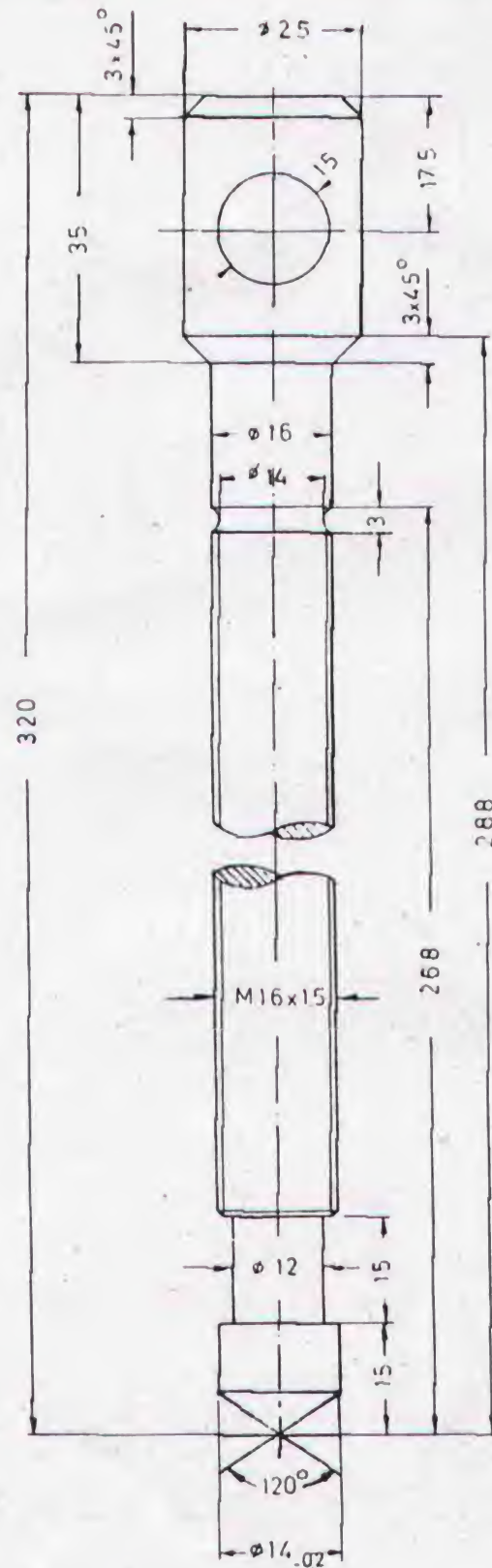
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



- Check bores $\varnothing 8$ and $\varnothing 12$ with plug gauges !

TURNER



1. Ø 16

14 - 0.2

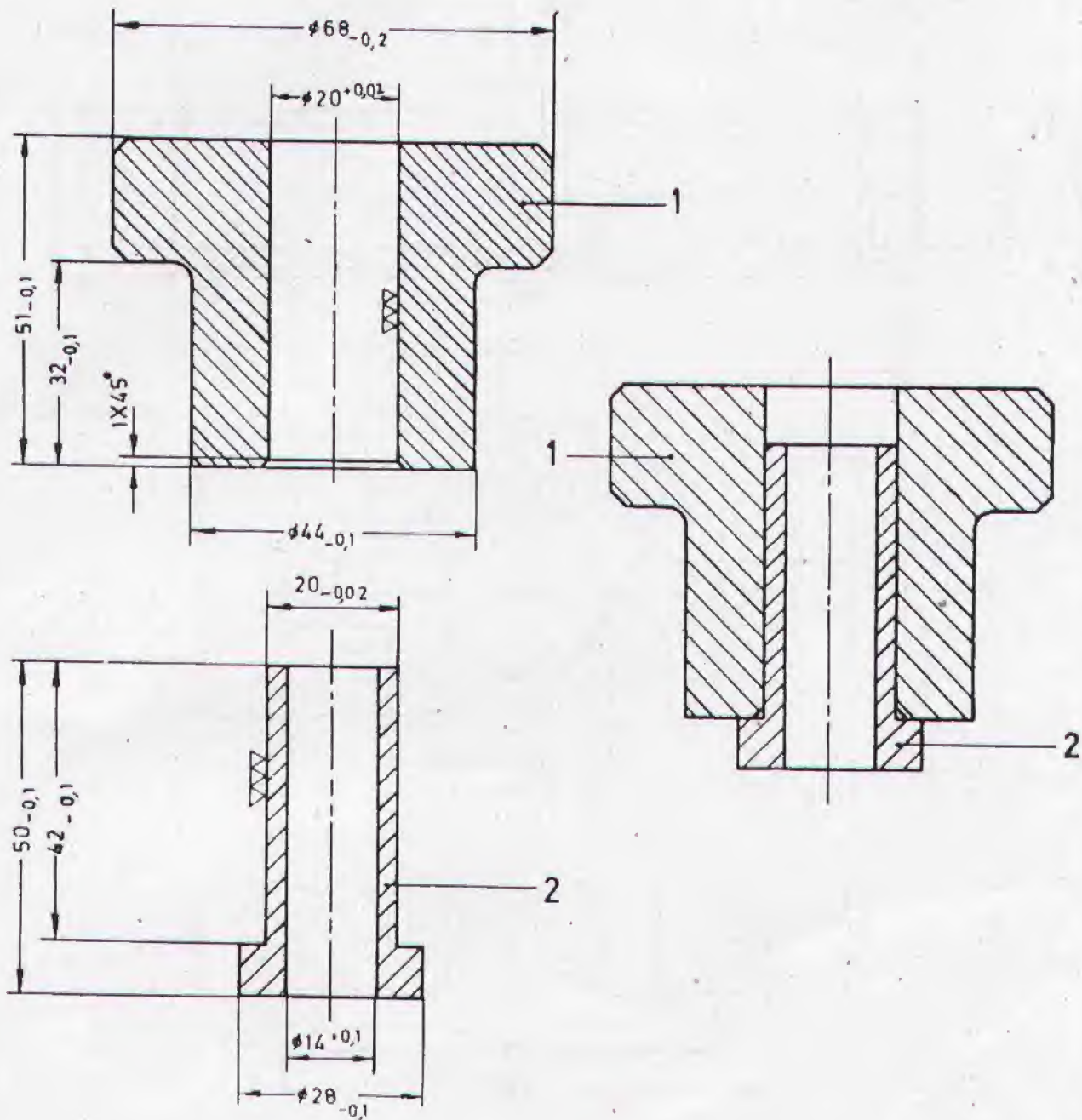
Before starting thread cutting check the pitch.

The raw piece is to be cut to a length of about 335 mm so that a centre bore can be made as shown in the detail to allow the use of a tailstock centre. After completing all operations (thread cutting) the spindle is to be clamped with the thread in a collet chuck or with the head in the three jaw chuck and the $\varnothing 12$ in the steady rest to allow completion of the 120° end.



TURNER

TOLERANCE FOR ALL DIM. ± 0.1
UNLESS OTHERWISE STATED



SCALE 1:1

MAT: MILDSTEEL

BUSH FITTING

MP/2.3/ 3.11/ 17

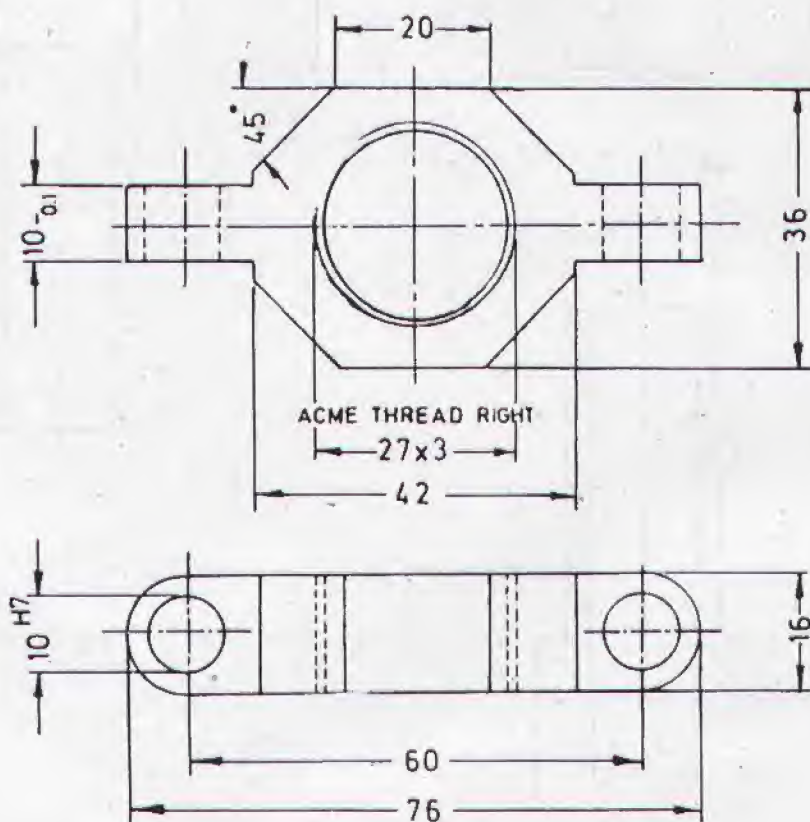
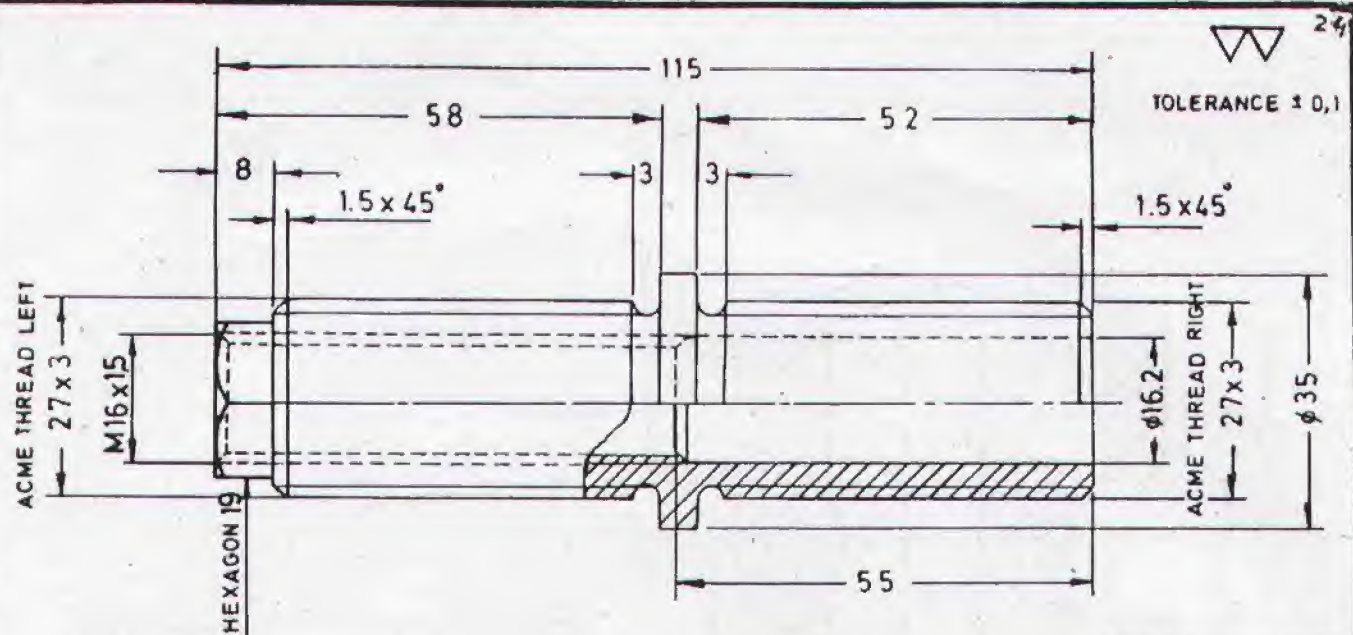
TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



SCALE 1:1

MAT: MILDSTEEL

SCREW SOCKET AND NUT

FROM 23.6/5

MP/23/3.1.1/18

TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

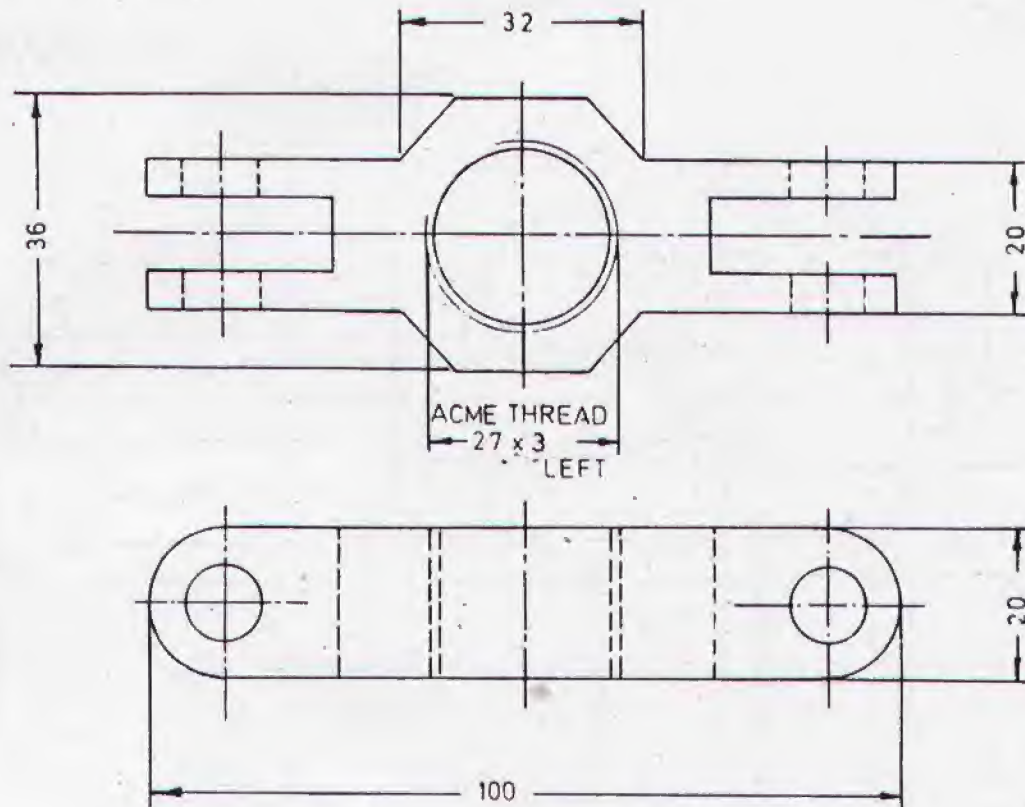
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

25



TOLERANCE ± 0.1 UNLESS
OTHERWISE STATED



SEQUENCE OF OPERATION

1. Mount four jaws chuck on Lathe Machine.
2. Hold finished milled workpiece in four jaws chuck and check true running.
3. Bore core diameter for Acme thread 27 x 3.
4. Cut left hand Acme thread.

CAUTION

Check the thread with the male piece.

SCALE 1:1

MAT: MILDSTEEL

FROM 3.21/3

LINK PIECE

MP/23/ 3.1.1/19

TURNING II



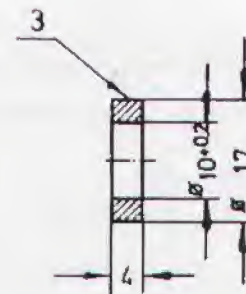
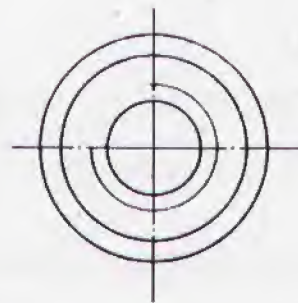
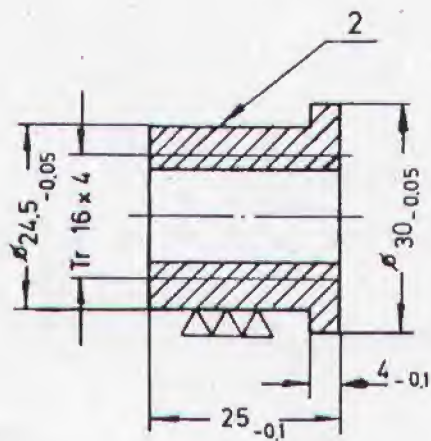
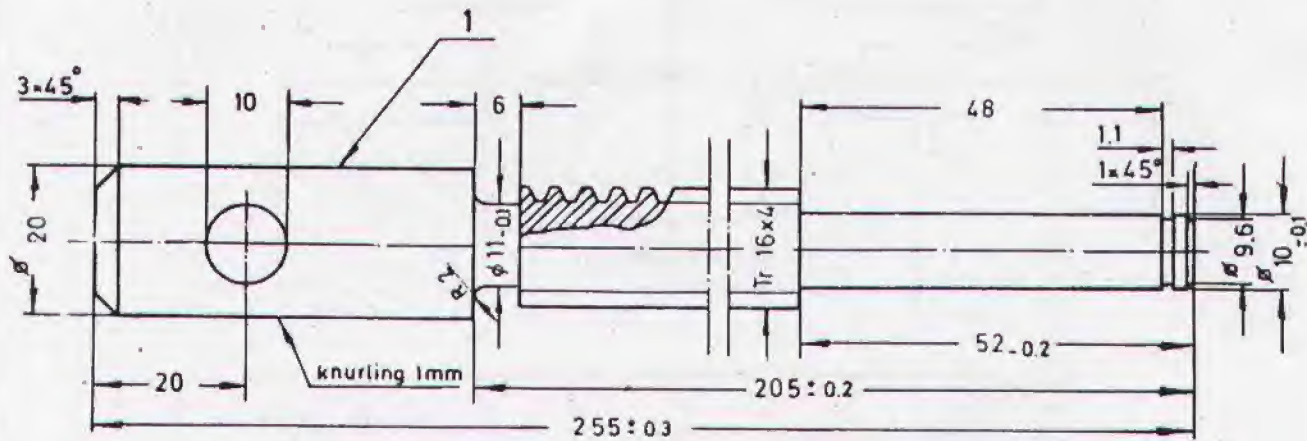
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance ± 0.1

∇ ($\nabla\nabla$)



Material: Mild-steel
Brass

SCALE 1:1

SPINDLE AND THREAD BUSH

MP/23/ 3.1.1/ 20

MAT:

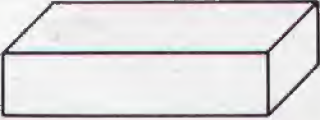
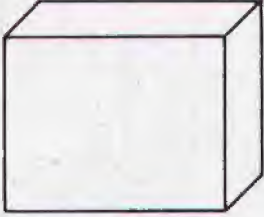
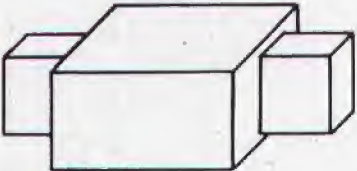
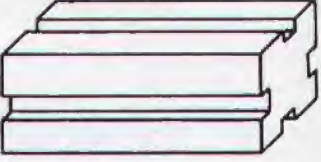
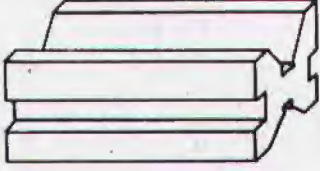
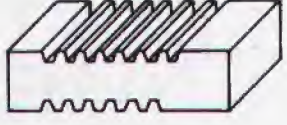
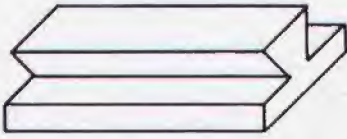
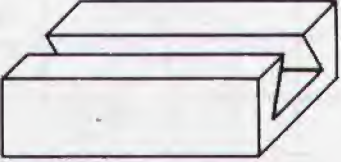
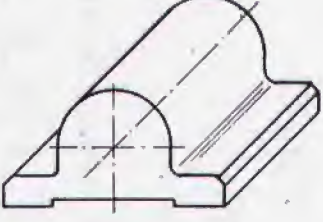
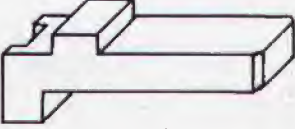
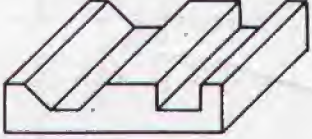

TURNING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

		
<p>Parallel and right angle shaping</p> <p>1 — 2 —→ 5</p>	<p>Shaping of Cast iron</p> <p>3 —→ 4.1.1/6</p>	<p>Step shaping</p> <p>4 —→ 4.1.1/8</p>
 <p>Shaping of grooves</p> <p>1 —→ 5 —→ 6</p>	 <p>Angular shaping</p> <p>5 —→ 6 —→ 3.2.4/8</p>	 <p>Rack shaping</p> <p>7</p>
 <p>Dove tail shaping, external</p> <p>8</p>	 <p>Dove tail shaping internal</p> <p>9</p>	 <p>Form shaping</p> <p>10 —→ 4.1.2/5</p>
 <p>Step shaping</p> <p>11</p>	 <p>Internal form shaping</p> <p>12</p>	 <p>External form shaping</p> <p>13</p>

In addition to the exercises shown above, the trainees have to make parts which are needed for the training centre.

TRADE
TRAINING II

LAYOUT

MP/2.1/ 3.1.2

SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

MATERIAL REQUIRED

TURNER

TRADE TRAINING II

SHAPING II

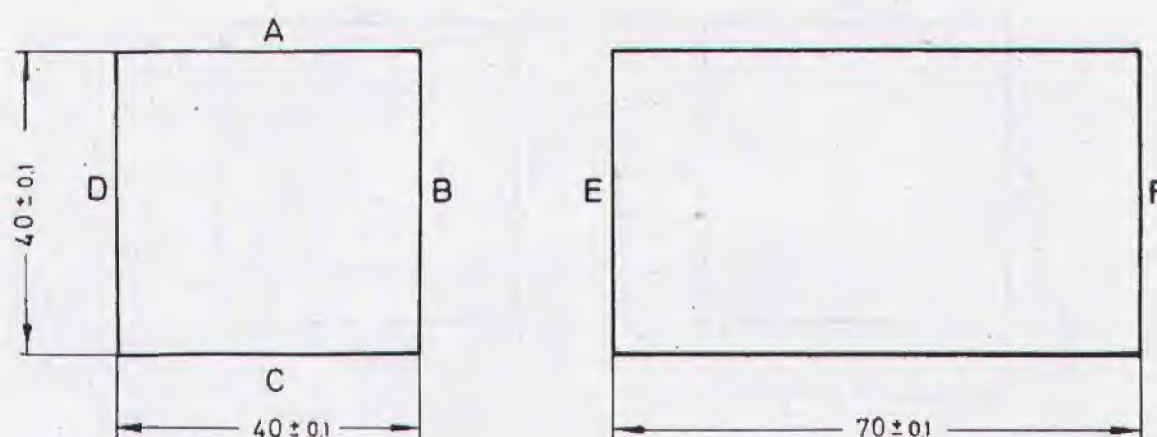
No.3.1.2/1 to 13

Exercise No. (Length given in Millimeter)	Length given in Millimeter													Length per trainee	Total Length for 16 trainees	Total weight for 16 trainees
	1	2	3	4	5	6	7	8	9	10	11	12	13			
M.S. SQUARE 44x44mm 1 3/4" x 1 3/4" sq.	76	46									116			238 mm	3.8 meter	58.5 kg
CAST IRON 96x30mm 3 3/4" x 1 1/4"			106											106 "	17 "	37.0 "
CAST IRON 76x42 mm 3" x 1 3/4"				120										120 "	2 "	48.0 "
CAST IRON SQ. 44x44mm 1 3/4" x 1 3/4" sq.					156									156 "	2.5 "	36.0 "
M.S. SQ. 62x62 mm 2 1/2" x 2 1/2" sq.						26	26							52 "	0.84 "	25.5 "
CAST IRON 81x76mm 3 1/4" x 3"									156					156 "	2.5 "	114.0 "
M.S. SQUARE 75x75mm 3" x 3" sq.												25	25	50 "	0.8 "	35.5 "



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. 40 ± 0.1
2. 40 ± 0.1
3. 70 ± 0.1
4. Angle A - B
5. Angle C - D
6. Angle A B C D - E
7. Angle A B C D - F
8. Parallel surface
9. Plane surface
10. Smoothness all over

Use parallel distance pieces to chuck the job
in the vice !

SCALE 1:1

MAT: MILD STEEL

V - BLOCK

MP/ 23/ 3.12/1

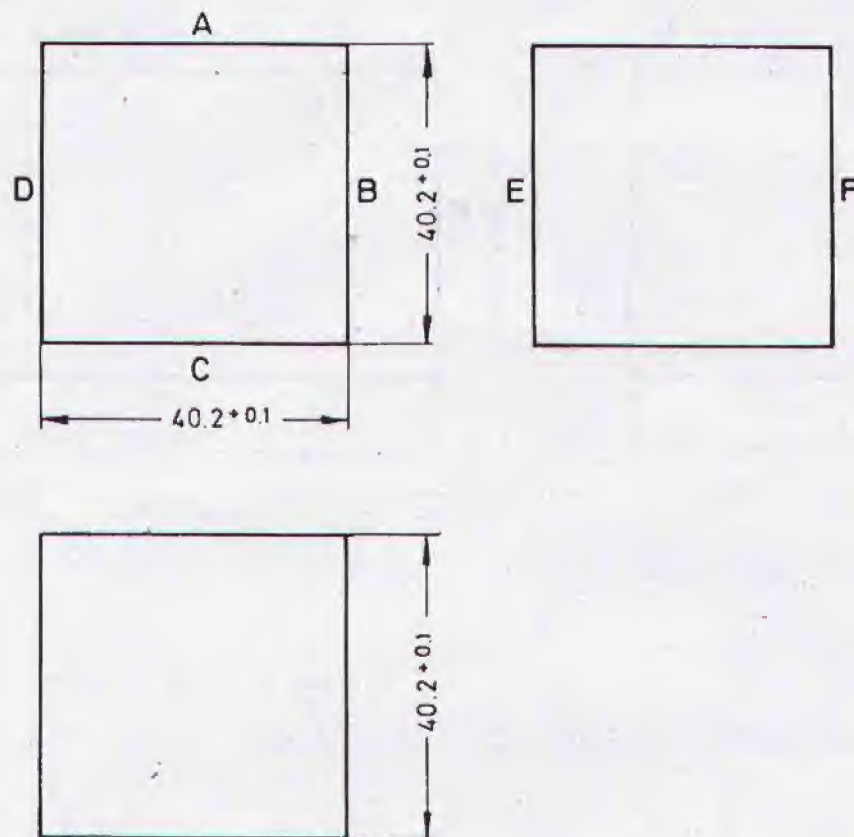
SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. 40.2 ± 0.1
2. 40.2 ± 0.1
3. 40.2 ± 0.1
4. Angle A - B
5. Angle C - D
6. Angle A B C D - E
7. Angle A B C D - F
8. Parallel surface
9. Plane surface
10. Smoothness all over

First shape two opposite surfaces parallel with each other !

SCALE 1:1

MAT: Mildsteel

CUBE

MP/2.3/3.1.2/2

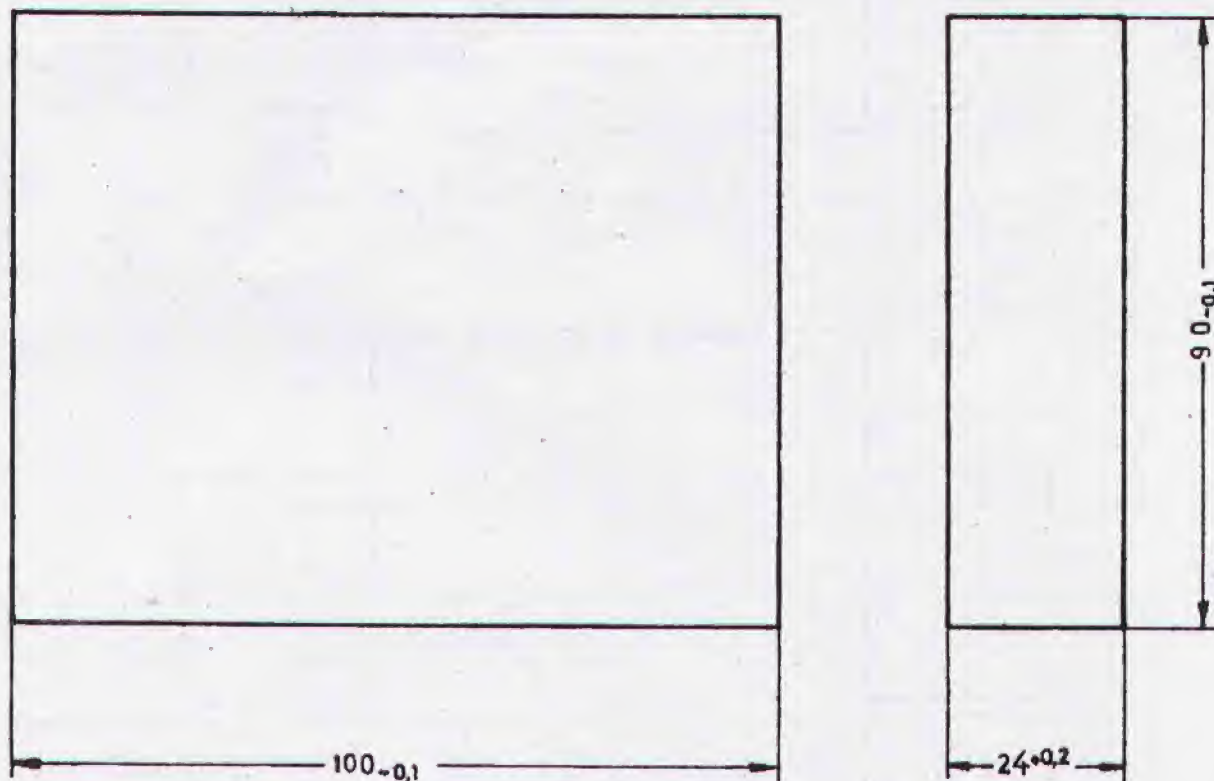
SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. Angles
2. Parallel surfaces
3. Plane surfaces
4. Smoothness all over

Mind the hard casting skin when you choose the depth of the first cut !

SCALE 1:1

MAT: CAST IRON

ECCENTRIC BORING PLATE

MP/23/ 3.1.2/3

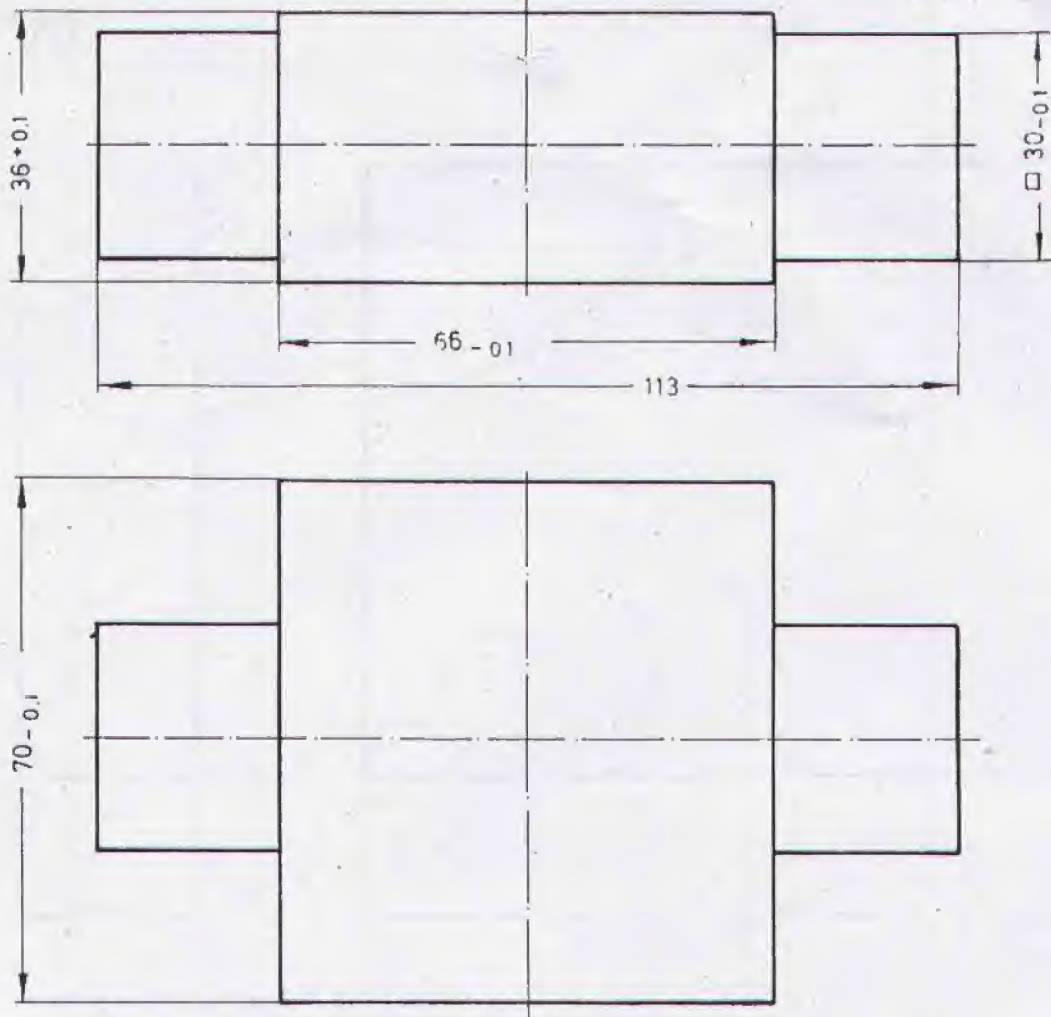
SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME


TURNER



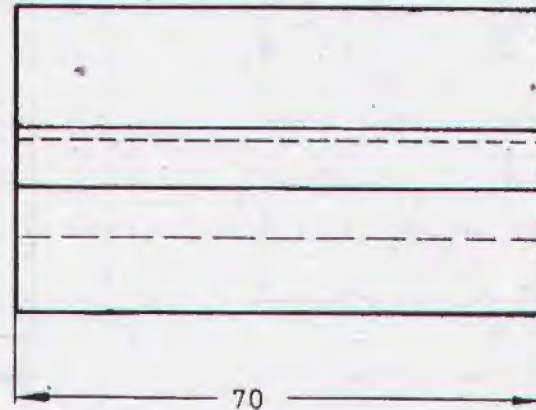
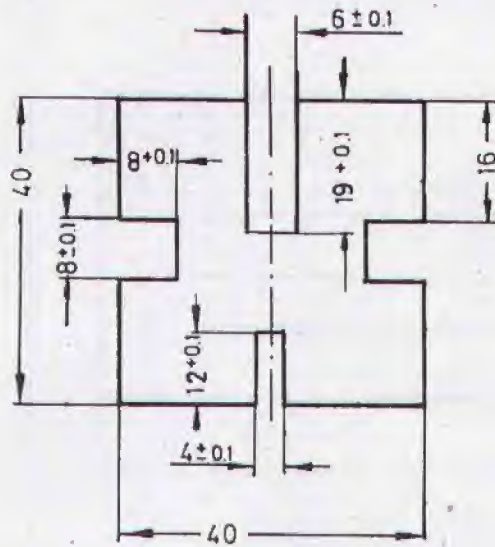
CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. 70 - 0.1
2. 66 - 0.1
3. 36 + 0.1
4. 30 - 0.1
5. 30 - 0.1
6. 30 - 0.1
7. 30 - 0.1
8. Angle surface
9. Parallel surface
10. Smoothness all over

Machining of cast iron does not require any cooling liquid !

SCALE 1:1	MOVEABLE NUT	MP/23/ 3.1.2/4
MAT: CAST IRON		SHAPING II
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		TURNER
PAK-GERMAN TECHNICAL TRAINING PROGRAMME		

Tolerance ± 0.1
unless otherwise stated



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. 18 - 0.1
2. 17 - 0.1
3. 16 - 0.1
4. 19 + 0.1
5. 12 + 0.1
6. 8 \pm 0.1
7. 8 \pm 0.1
8. Notches, parallel and rectangular
9. Notches, smoothness
10. Smoothness all over

Grind the slotting tool to 4 mm width to shape the 4 mm slot !

SCALE 1:1

MAT: MILDSTEEL

Mat from Ex 1

V-BLOCK

MP/ 23/ 3.1.2/5

SHAPING II

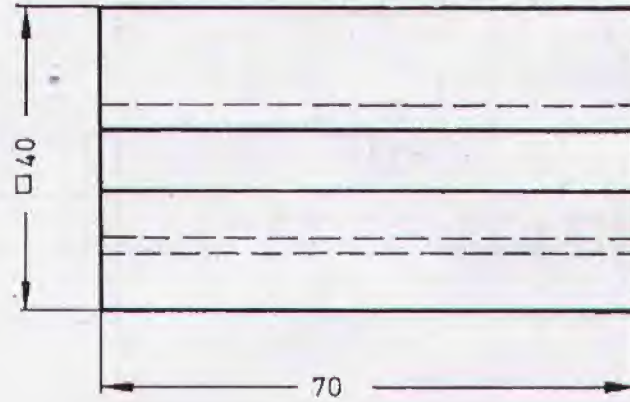
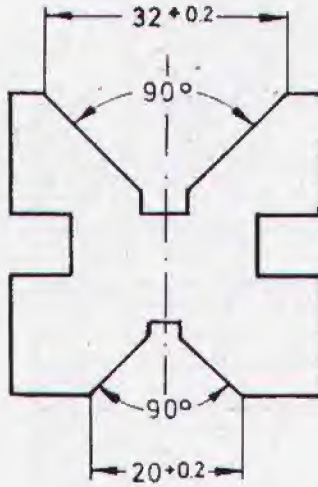


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance ± 0.2
unless otherwise stated



CHECK THE FOLLOWING POINTS CAREFULLY

1. 32 ± 0.2
2. 90°
3. 20 ± 0.2
4. Angle 90°
5. Parallel Surfaces
6. Smoothness all over

When checking the 90° angle the edge of the try-square must not touch the bottom of the groove !

SCALE 1:1

MAT: MILDSTEEL

from Ex 5

V- BLOCK

MP/2.3/3.1.2 / 6

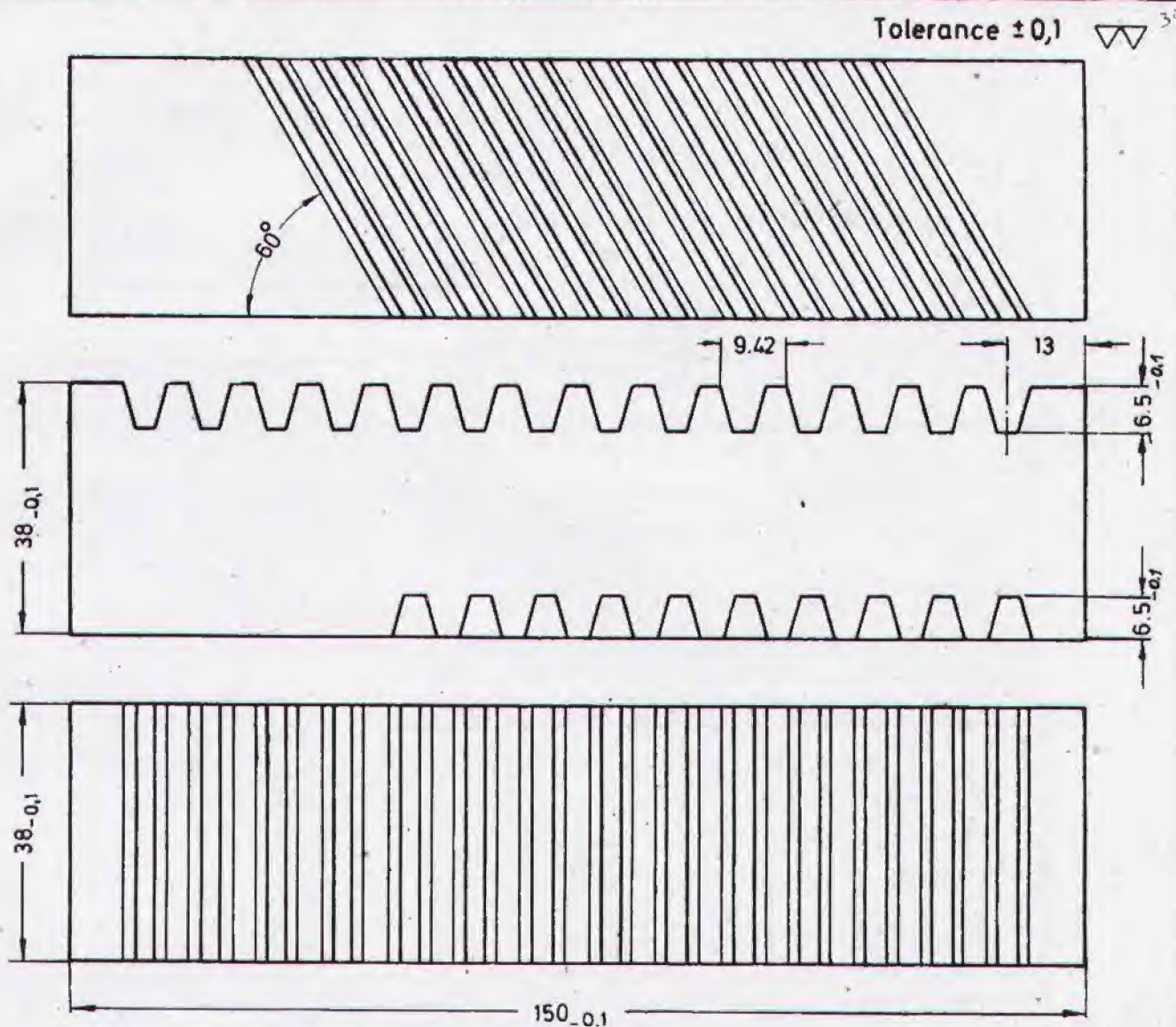
SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



CHECK THE FOLLOWING POINTS VERY CAREFULLY

Modul : 3

1. 150 - 0.1
2. 38 - 0.1
3. 38 - 0.1
4. 6.5 - 0.1
5. 6.5 - 0.1
6. Accuracy of angle 60°
7. Dimensional accuracy of teeth 90°
8. Dimensional accuracy of teeth 60°
9. Angle and parallel surface
10. Smoothness all over

All teeth must be precisely parallel !

SCALE 1:1

MAT: CAST IRON

RACK

MP/2.3/3.1. 2/7

SHAPING II

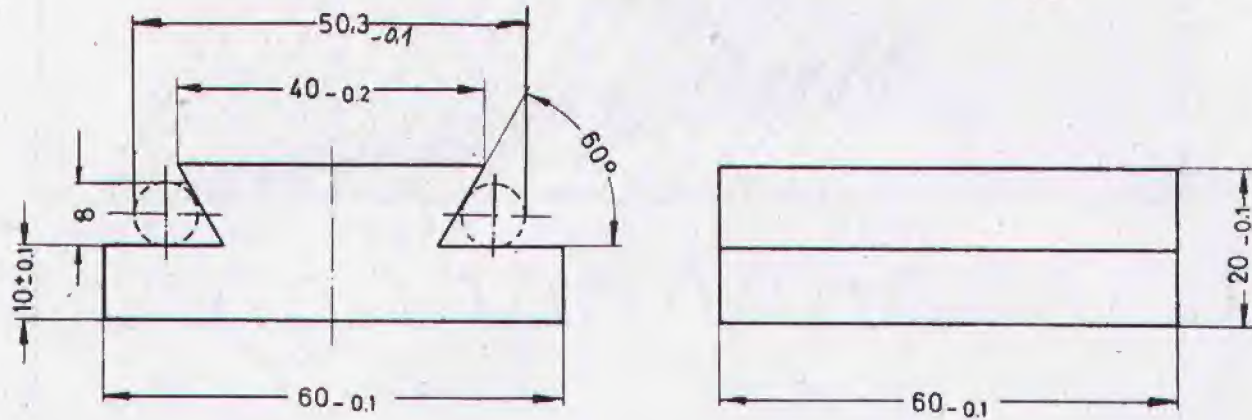


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance $\pm 30'$



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. $60 - 0.1$
2. $60 - 0.1$
3. $50.3 - 0.1$
4. $20 - 0.1$
5. 10 ± 0.1
6. 10 ± 0.1
7. Angle 60°
8. Angle 60°
9. Angle and parallel surface
10. Smoothness all over

Debur carefully after shaping !

SCALE 1:1

DOVE TAIL

MP/23/3.1.2/8

MAT: MILDSTEEL

SHAPING II

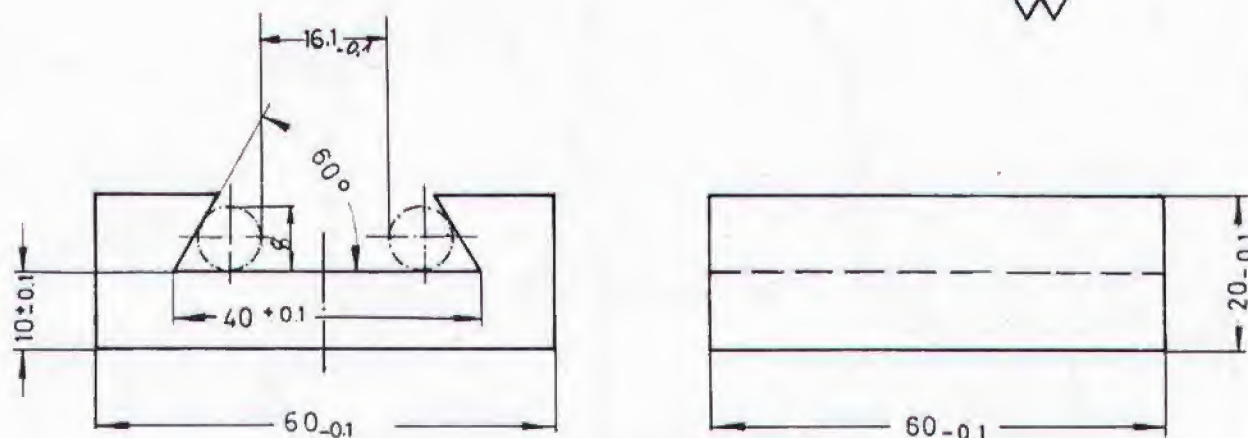


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance $\pm 30^\circ$



CHECK THE FOLLOWING POINTS VERY CAREFULLY

1. $60 - 0.1$
2. $60 - 0.1$
3. $16.1 + 0.1$
4. $40 + 0.1$
5. $20 - 0.1$
6. 10 ± 0.1
7. Angle 60°
8. Angle 60°
9. Angle and parallel surface
10. Smoothness all over

Check the dove tail with the matching piece shown in drawing no. 8 !

SCALE 1:1

MAT: MILDSTEEL

DOVE TAIL

MP/2.3/3.1.2/9

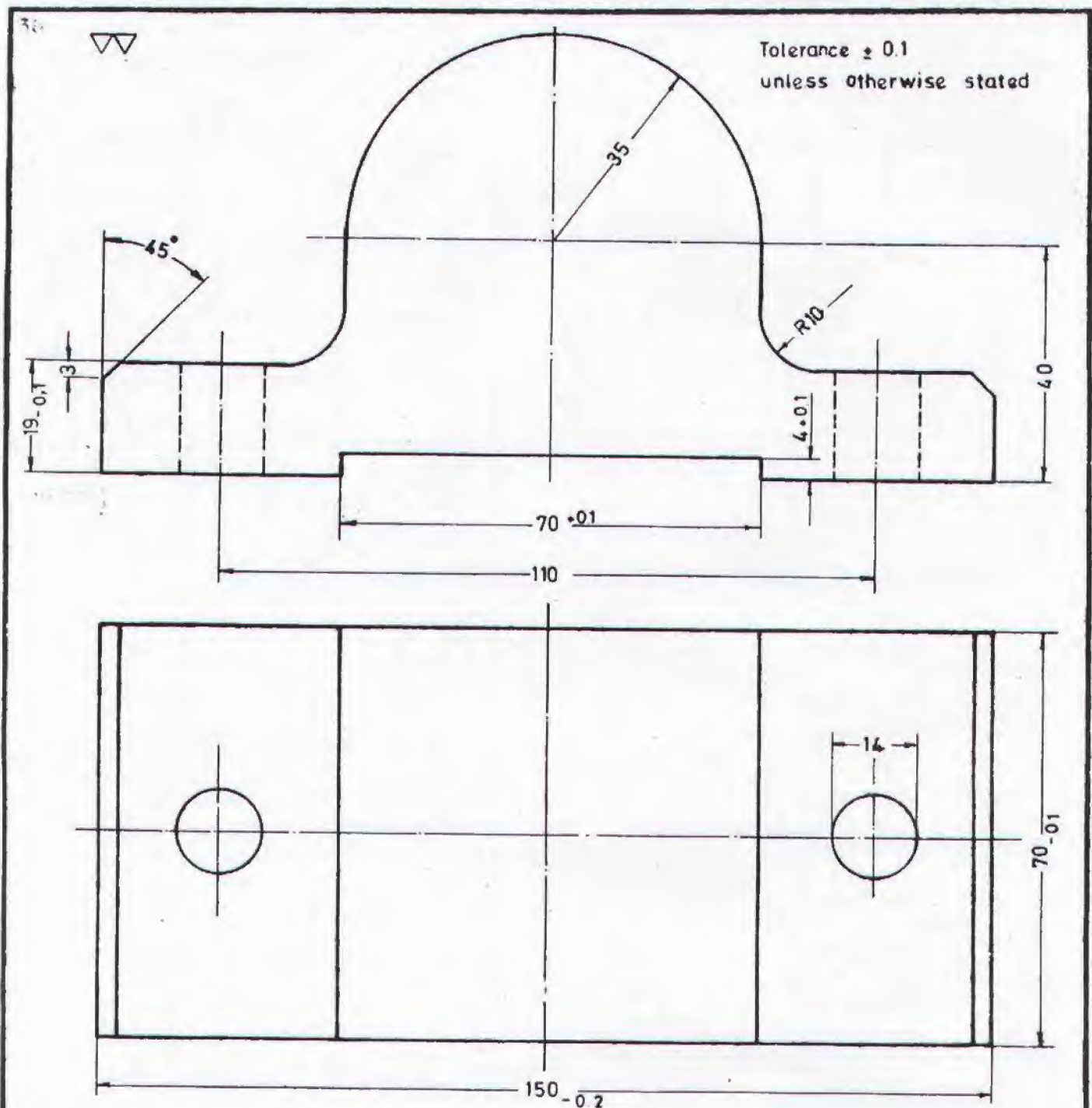
SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



SEQUENCE OF OPERATION

1. Shape the base surface and recess 70 x 4.
2. Use this face as a reference to shape the width 70.
3. Shape to length 150.
4. Shape radius 35 mm and thickness 19 mm.
5. Chamfer 3 x 45°.

SCALE 1:1

MAT. CAST-IRON

BRACKET

MP/2.3/3.1.2/10

SHAPING II

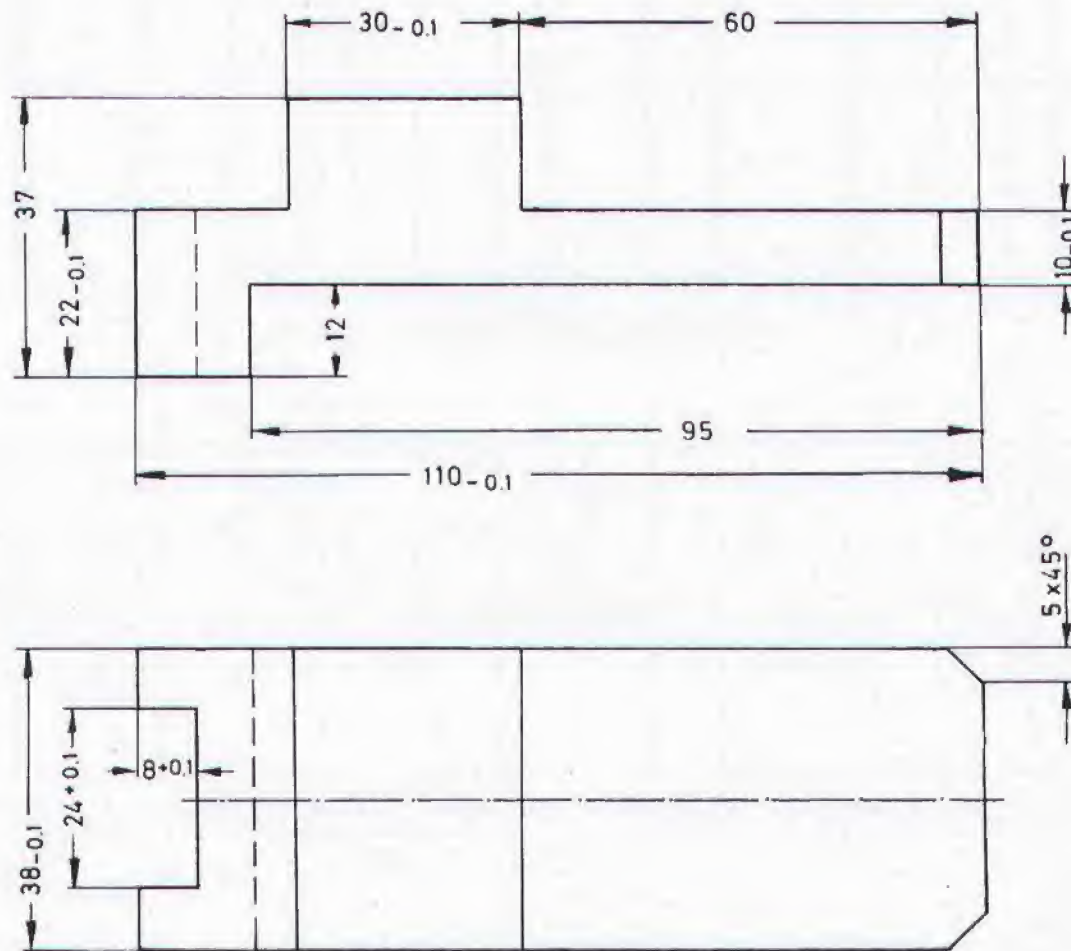


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance ± 0.1



SCALE 1:1

MAT.MILD STEEL

CLAMPING TOOL

MP/2.3/3.1.2/11

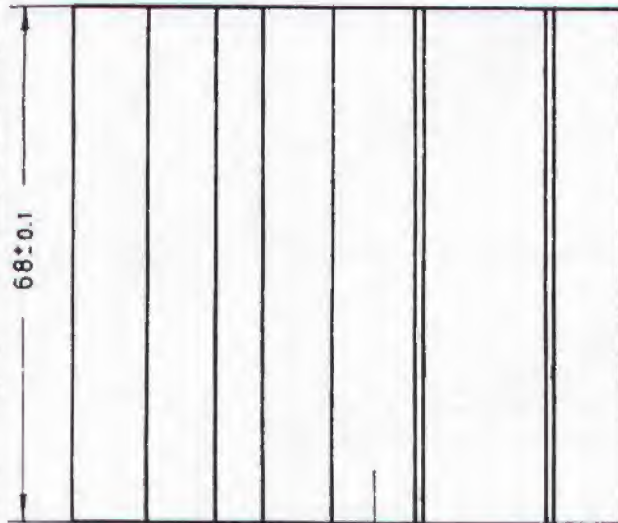
SHAPING II



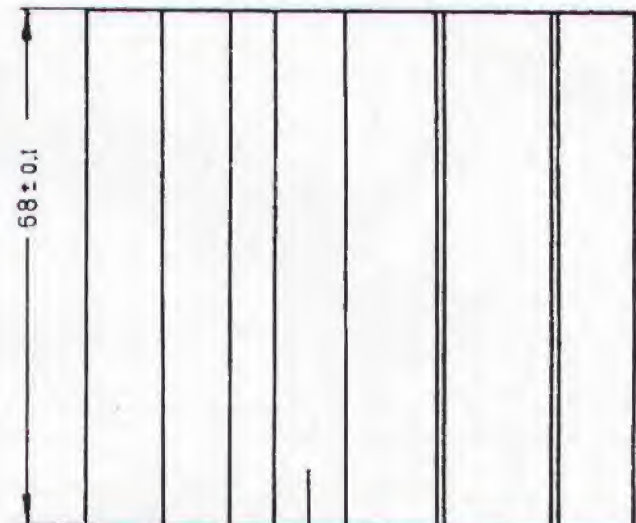
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

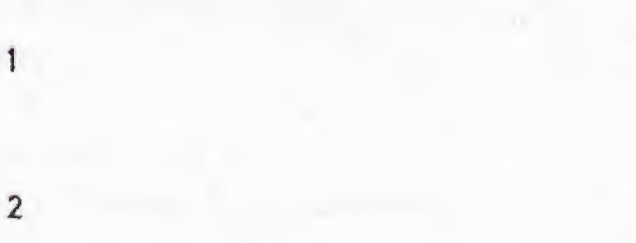
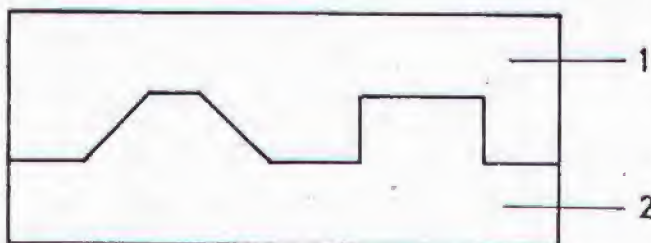
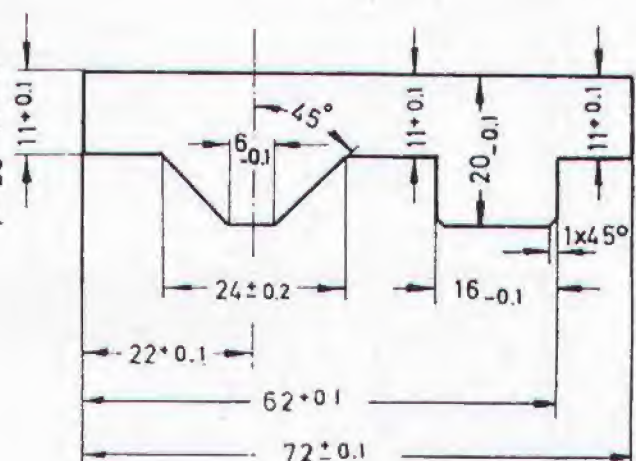
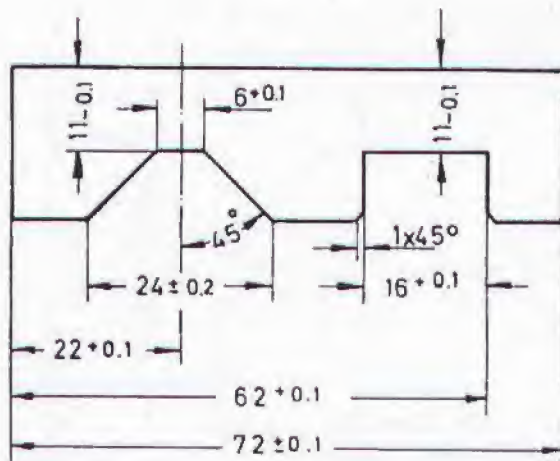
TURNER



1



2



SCALE 1:1

MAT: MILDSTEEL

TONGUE FITTING

MP/ 23/ 3.1.2/12-13


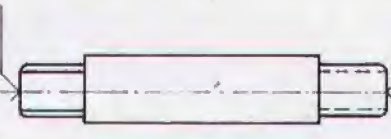
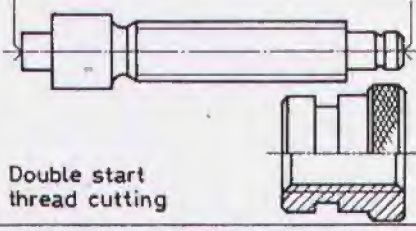

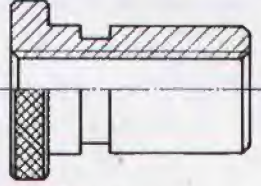
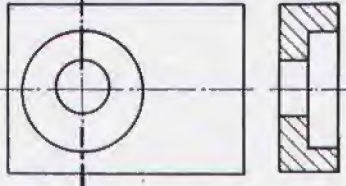

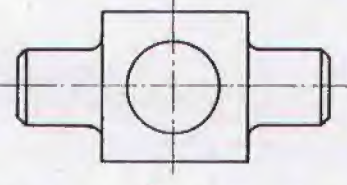
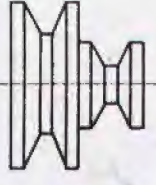
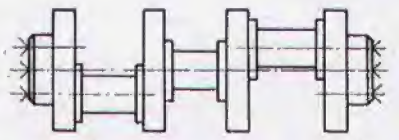
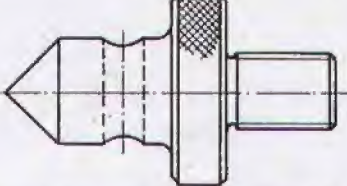
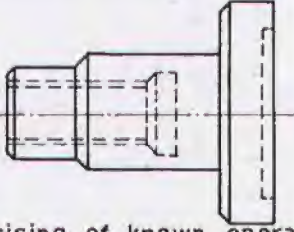
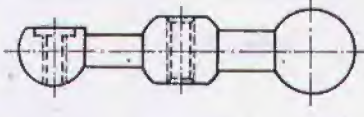
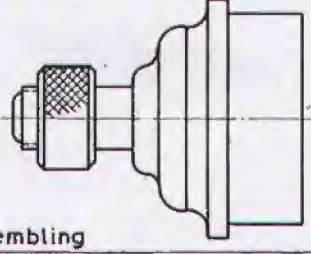
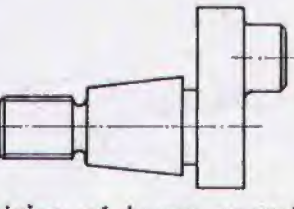
SHAPING II



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

 <p>Longitudinal turning</p> <p>1 → 4.2.2/1</p>	 <p>Turning between centres</p> <p>2 → 4.2.2/</p>	 <p>Double start thread cutting</p> <p>3</p>
 <p>Thread cutting</p> <p>4 → 4.3.2/2</p>	 <p>Knurling, Boring</p> <p>5 → 4.3.2/2</p>	 <p>Eccentric boring</p> <p>3.1.2/3 → 6</p>
 <p>Eccentric turning</p> <p>7</p>	 <p>Working on a four jaw chuck</p> <p>3.1.2/4 → 8</p>	 <p>Working on a Mandrel</p> <p>9</p>
 <p>Eccentric turning</p> <p>10 → 4.2.2/8</p>	 <p>Exercising of known operations</p> <p>11</p>	 <p>Exercising of known operations</p> <p>12</p>
 <p>Form turning</p> <p>13</p>	 <p>Assembling</p> <p>14</p>	 <p>Exercising of known operations</p> <p>15</p>

In addition to the exercises shown above, the trainees have to make parts which are needed for the training centre.

TRADE
TRAINING III

LAYOUT

MP/2.1/4.1.1

TURNING III



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

MATERIAL REQUIRED

TURNER

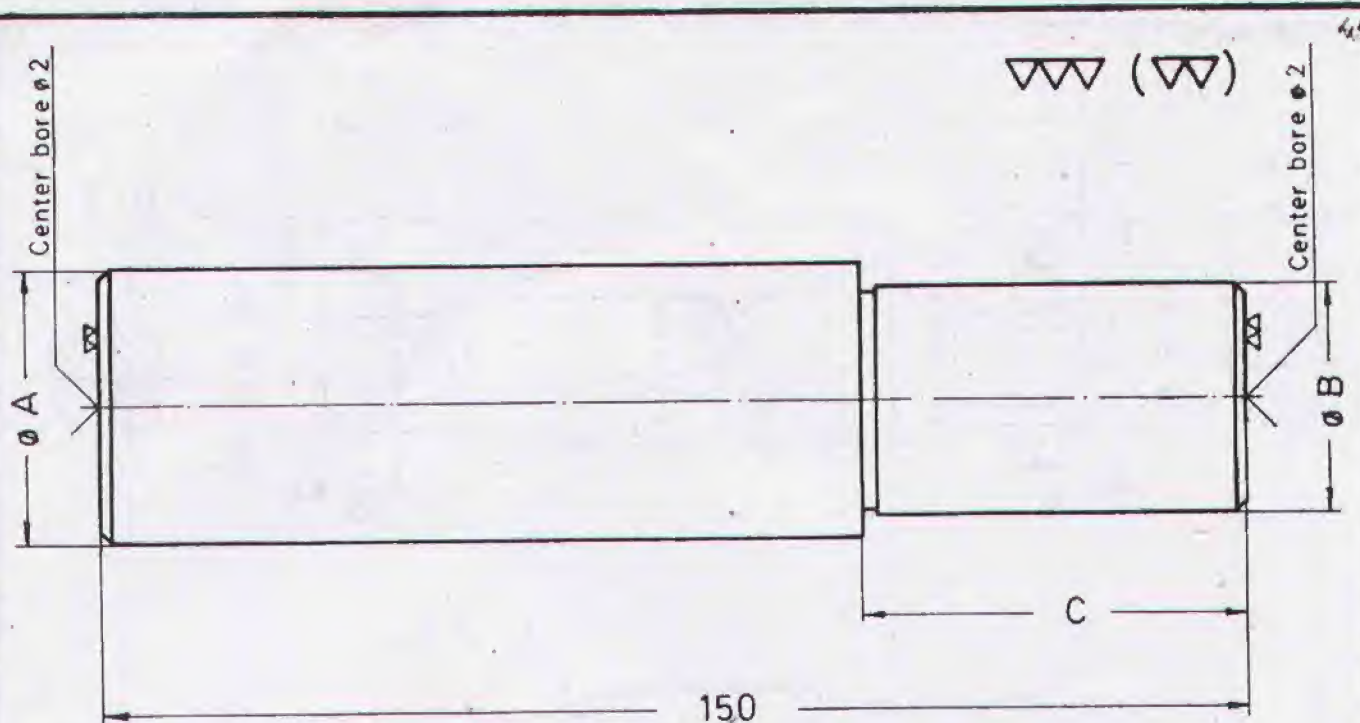
TRADE TRAINING III

TURNING III

No. 4.1.1/
Exercise No.


(Length given in Millimeter)

Exercise No.	5.2	5.3	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095	1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125	1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140	1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470</
--------------	-----	-----	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	--------



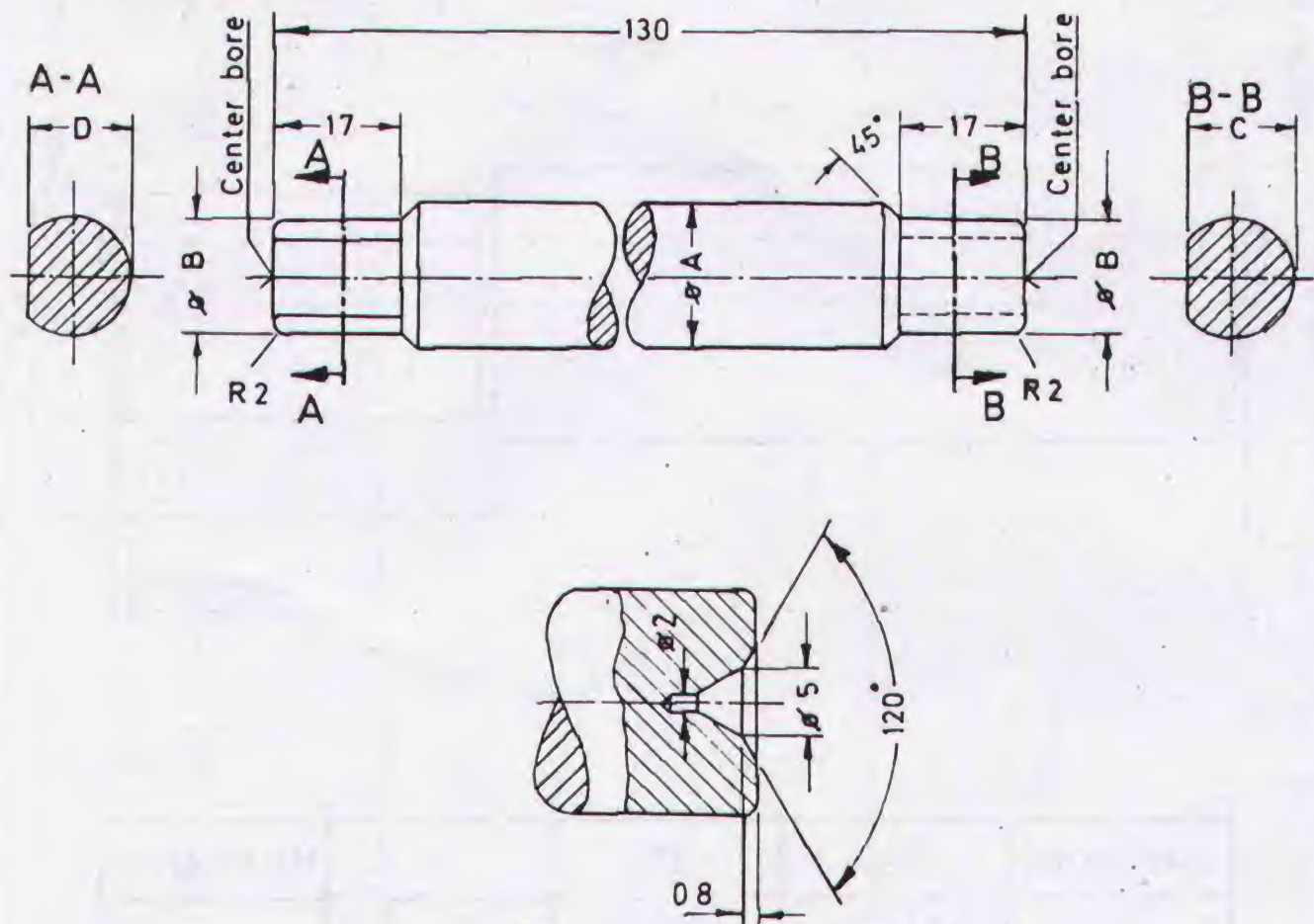
Exercise No	ϕA	ϕB	C	Marks given
1.1	$38 \pm 0,03$	$34 \pm 0,03$	$40 \pm 0,1$	
1.2	$36 \pm 0,02$	$32 \pm 0,02$	$42 \pm 0,1$	
1.3	$33 \pm 0,02$	$29 \pm 0,02$	$44 \pm 0,1$	
1.4	$30 \pm 0,01$	$27 \pm 0,01$	$46 \pm 0,1$	

Diameters must be checked with the Micrometer 25 to 50 mm.

SCALE 1:1	MEASURING EXERCISE	MP/23/4.11/ 1'
MAT: MILDSTEEL		TURNING !!!
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		TURNER

TOLERANCE ± 0.1

48



Grinding ϕ	ϕA	ϕB	C
$\phi 15$	15,2	13	12
$\phi 16$	16,2	14	12,5
$\phi 17$	17,2	14,5	13
$\phi 18$	18,2	15	13
$\phi 19$	19,2	16	14

SCALE 1:1

MAT.CARBON ST.

Mandrel

MP/2.3/4.1/2

TURNING III



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

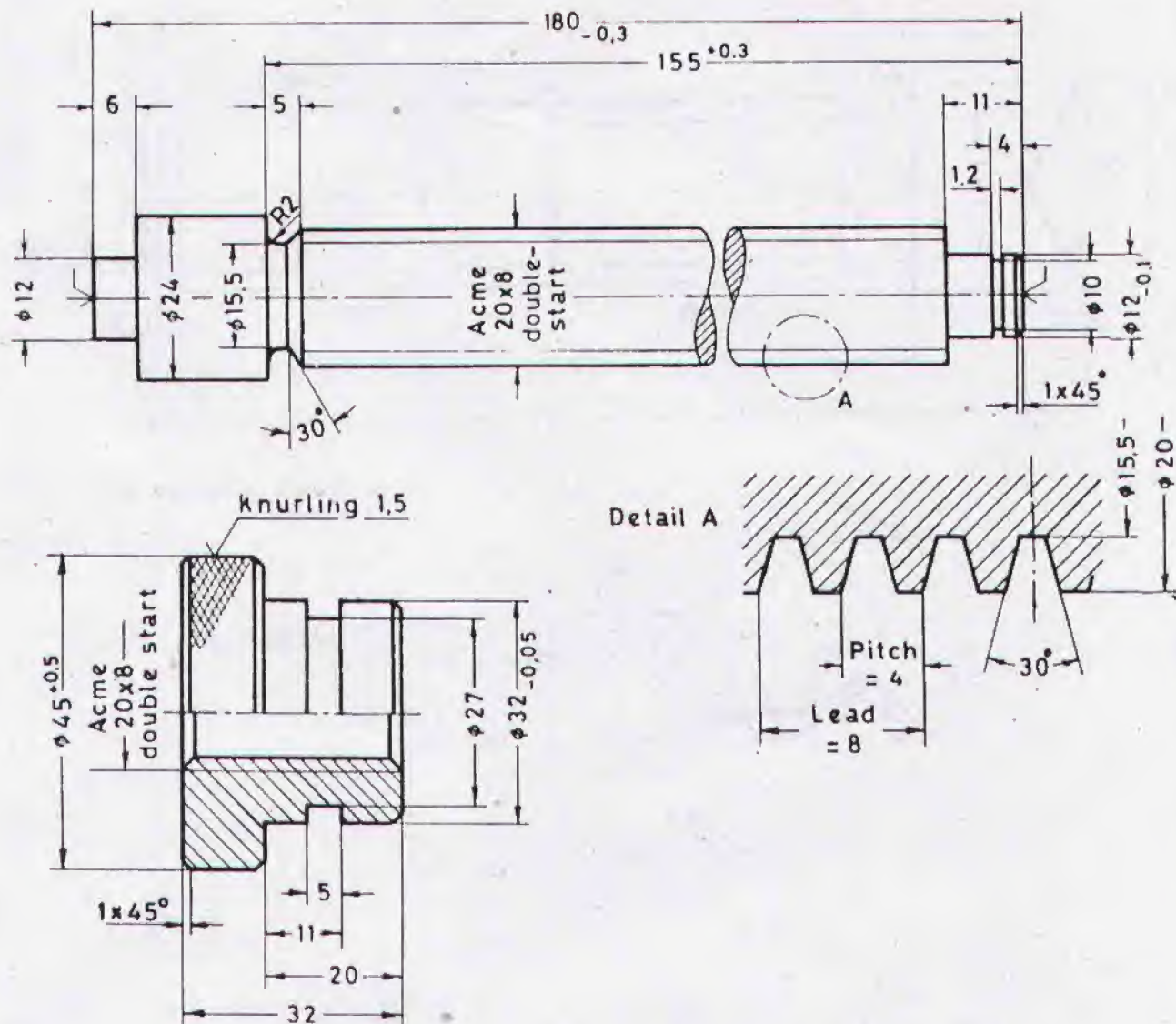
TURNER



47

Tolerance ± 0.1
unless otherwise stated

47



CUTTING A MULTIPLE THREAD, PROCEED AS IF CUTTING A SINGLE THREAD OF THE REQUIRED LEAD BY USING A TOOL ACCORDING TO THE GIVEN PITCH.

AFTER CUTTING THE FIRST THREAD GROOVE, IT IS NECESSARY TO GIVE THE WORK EXACTLY HALF A TURN WITHOUT TURNING THE LEAD SCREW.

USE THE METHOD TO DISENGAGE THE INTERMEDIATE GEAR FROM THE SCREW GEAR TO MOVE THE LATHE SPINDLE ONE HALF TURN.

SCALE 1:1

MAT. MILD STEEL

SPINDLE AND NUT
(with double thread)

MP/2.3/4.11/3

TURNING III



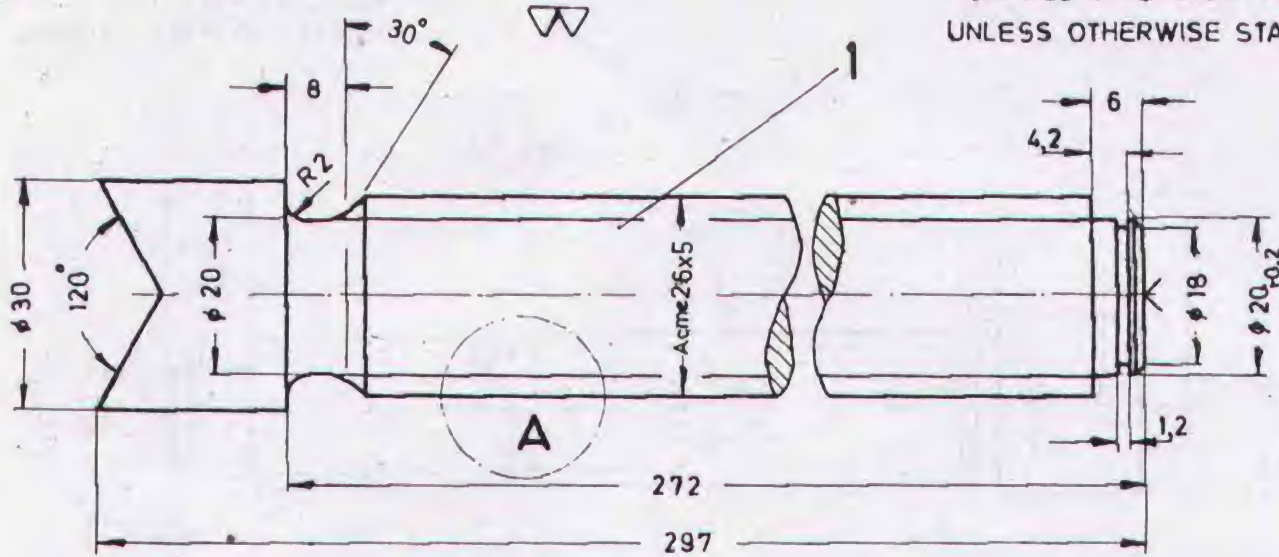
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

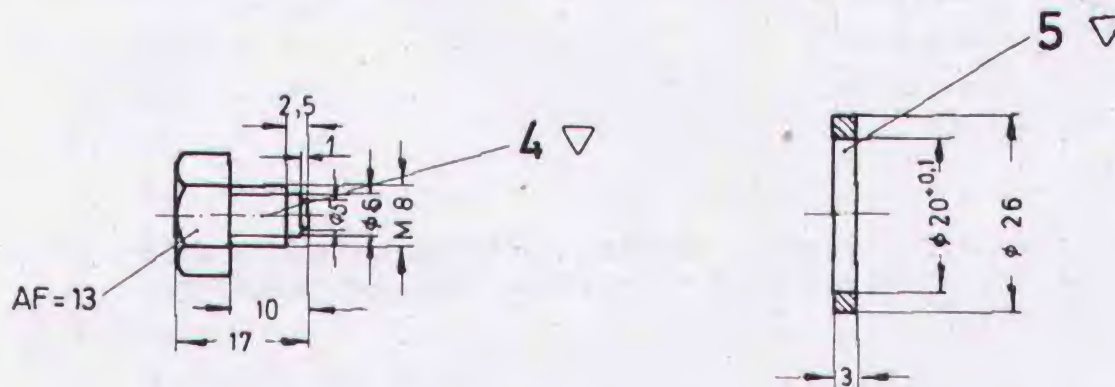
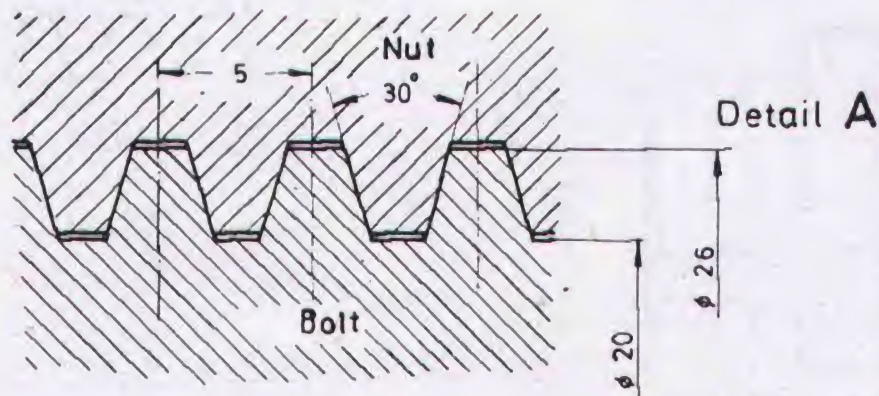
TURNER

48

FOR ALL DIMENSION ± 0.1
UNLESS OTHERWISE STATED



Acme threads $\phi 26 \times 5$ mm pitch



1	Washer		St 37	5	$\phi 30 \times 3$
1	Hexagon bolt	DIN 558	St 37	4	M8 X 10
1	Spindle		St 37	1	$\phi 30 \times 302$
REQD	NAME	STANDARD	MATERIAL	NO	SIZE

SCALE 1:1

MAT. MILD STEEL

DETAIL OF SUPPORT

MP/2.3/4.1.1/4

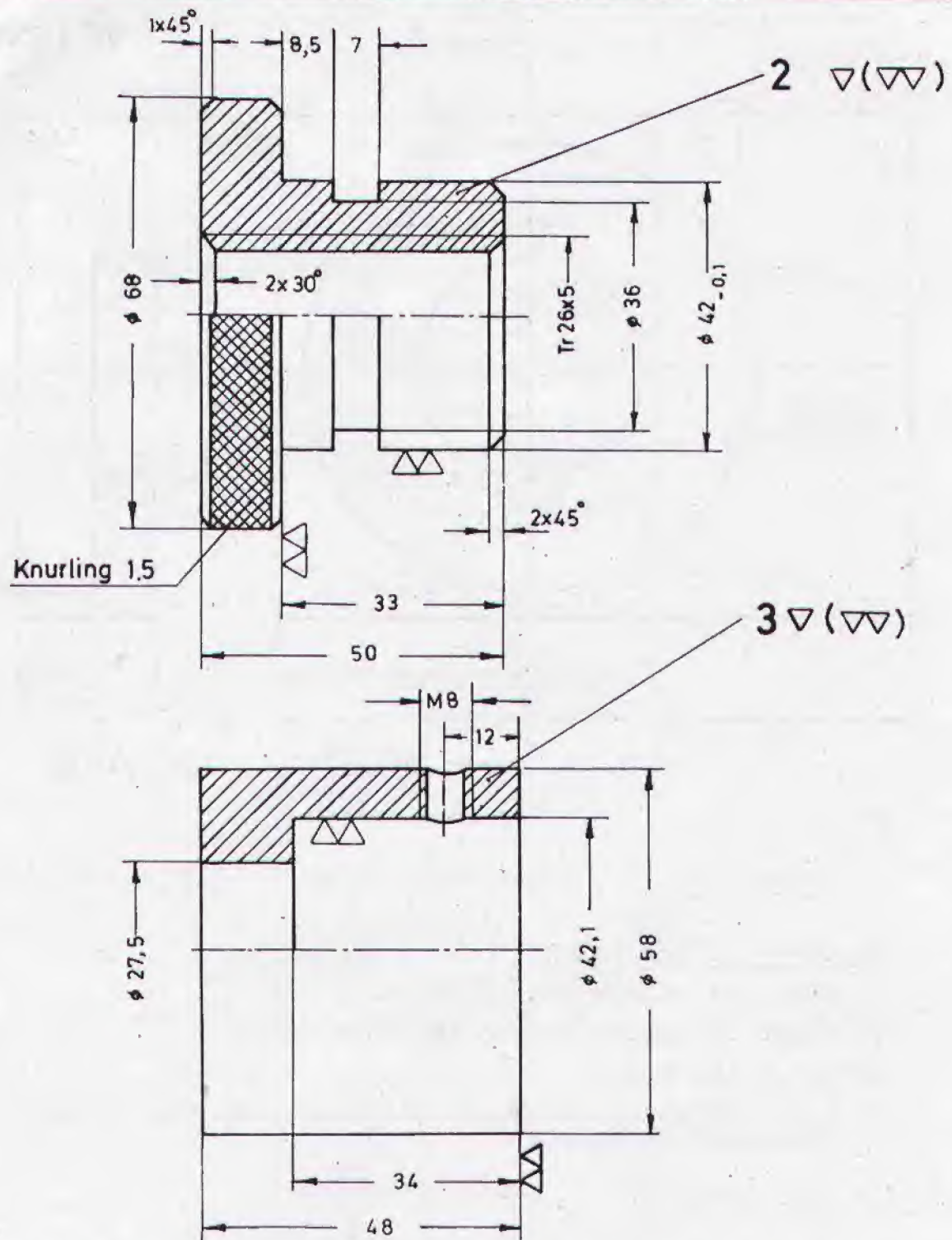
TURNING III



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Hold the nut by using the ready spindle as a mandrel to turn $\phi 42$ and groove.

1	Head		St 37	3	$\phi 60 \times 50$
1	Nut		St 37	2	$\phi 70 \times 52$
REQD	NAME	STANDARD	MATERIAL	NO	SIZE

SCALE 1:1

MAT: MILDSTEEL

DETAIL OF SUPPORT

MP/2.3/4.1.1/5

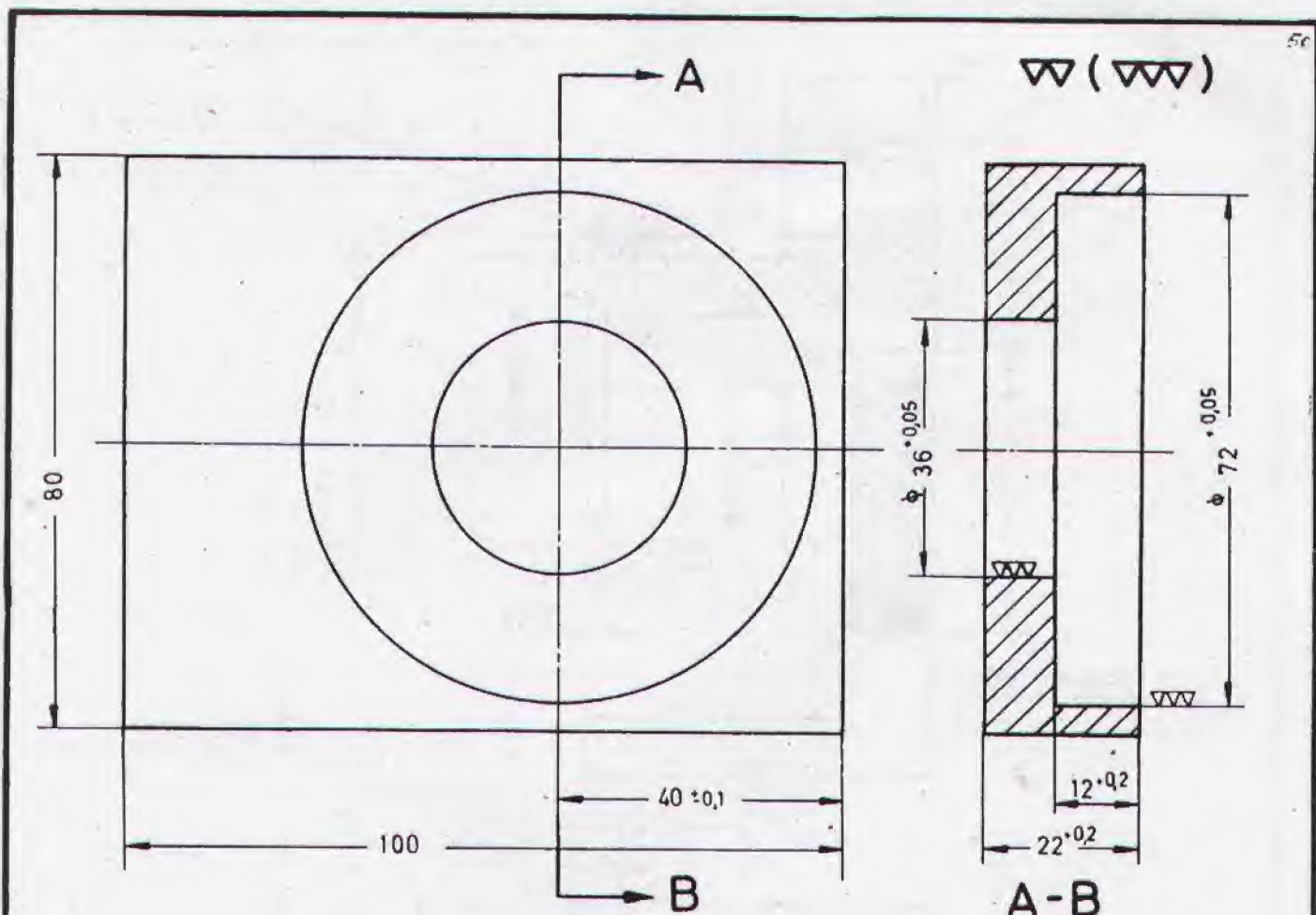
TURNING III



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Sequence of Operation

1. Mark and center the workpiece
2. Clamp the workpiece on the face plate
3. Rough the bores
4. When finishing, check the diameter with the internal dial test indicator

SCALE 1:1

MAT. CAST IRON

ECCENTRIC BORING PLATE

From 312/6

MP/2.3/4.1.1/6

TURNING III

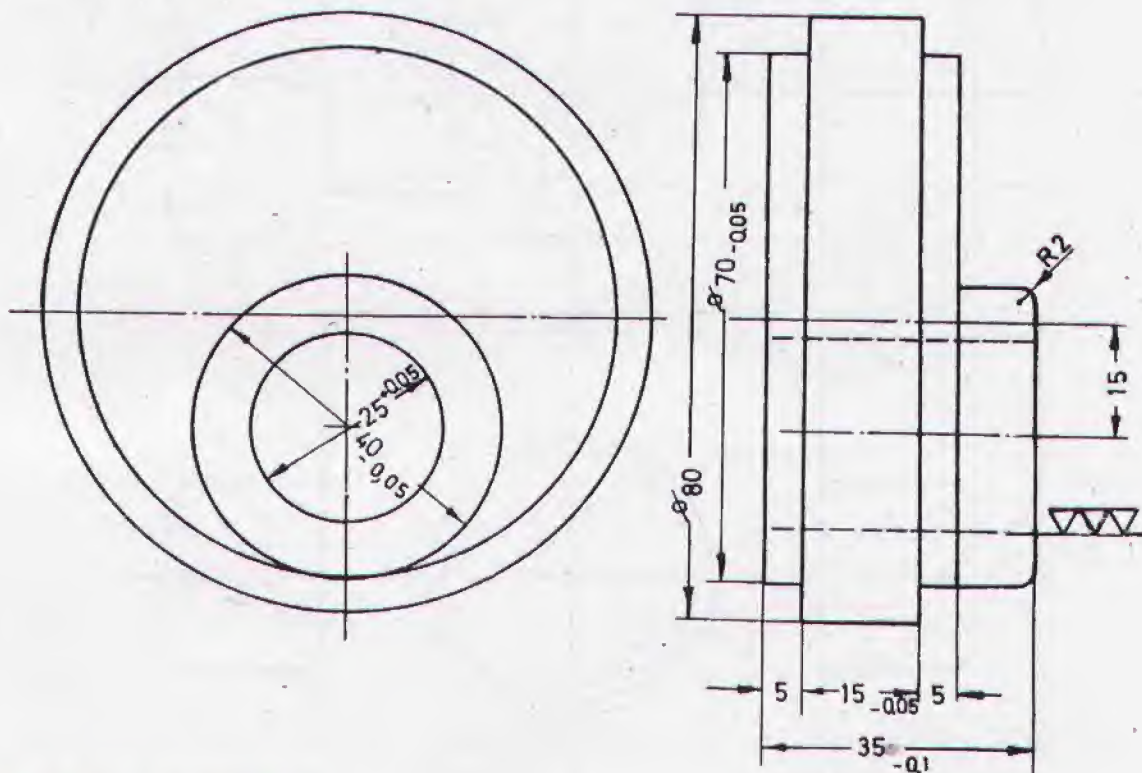


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

FOR ALL DIMENSIONS ± 0.1
UNLESS OTHERWISE STATED



SEQUENCE OF OPERATION

1. Hold workpiece in 3-jaw chuck, face and turn outside $\phi 80 \times 21$.
2. Turn step $\phi 70 \times 5$. Re-chuck, face to length 35 mm.
3. Turn step $\phi 70 \times 15$.
4. Mark out excentre 15 mm and centre drill with the help of drilling machine.
5. Mount 4-jaw chuck.
6. Hold workpiece in such a way that the previously drilled centre hole runs true.
7. Turn excentre $\phi 40 \times 10$ and radius 2.
8. Pre-drill and drill $\phi 24.5$
9. Mount boring tool and finish hole to $\phi 25$.

SCALE 1:1

MAT: CAST IRON

ECCENTRIC SHEAVE

MP/23/4.1.17

TURNING III



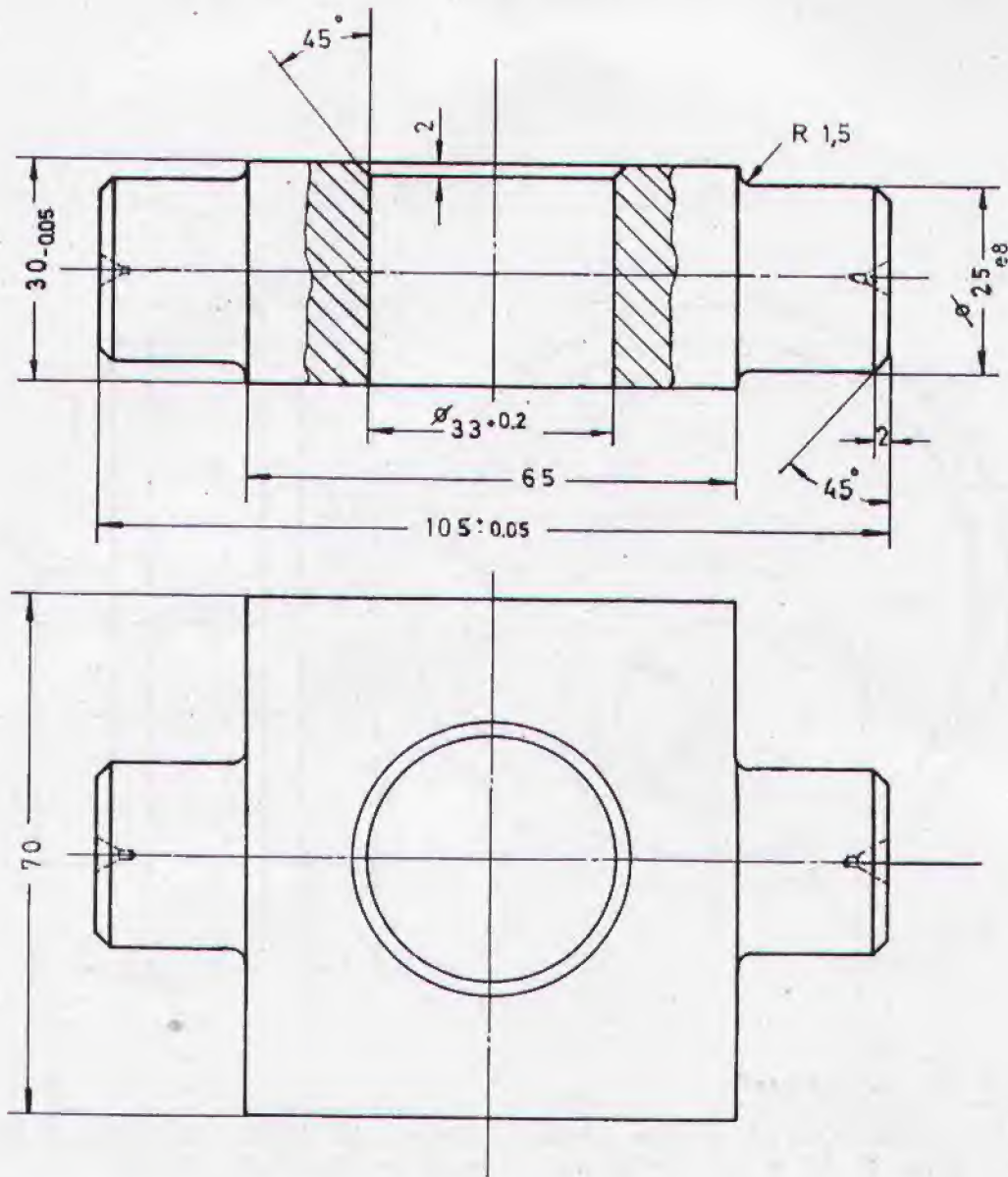
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance ± 0.1

$\nabla \nabla (\nabla \nabla)$



SEQUENCE OF OPERATION

1. Mark out the centres and drill.
2. Hold in 4-jaw chuck, pre-drill and bore hole $\phi 33$.
3. Hold between centres and turn both sides to $\phi 25_{e8} \times 20$.

25 $e8$ -0.040
 -0.078

SCALE 1:1

MAT: CAST IRON

MOVEABLE NUT

From 3.12/4

MP/2.3/4.1/8

TURNING III



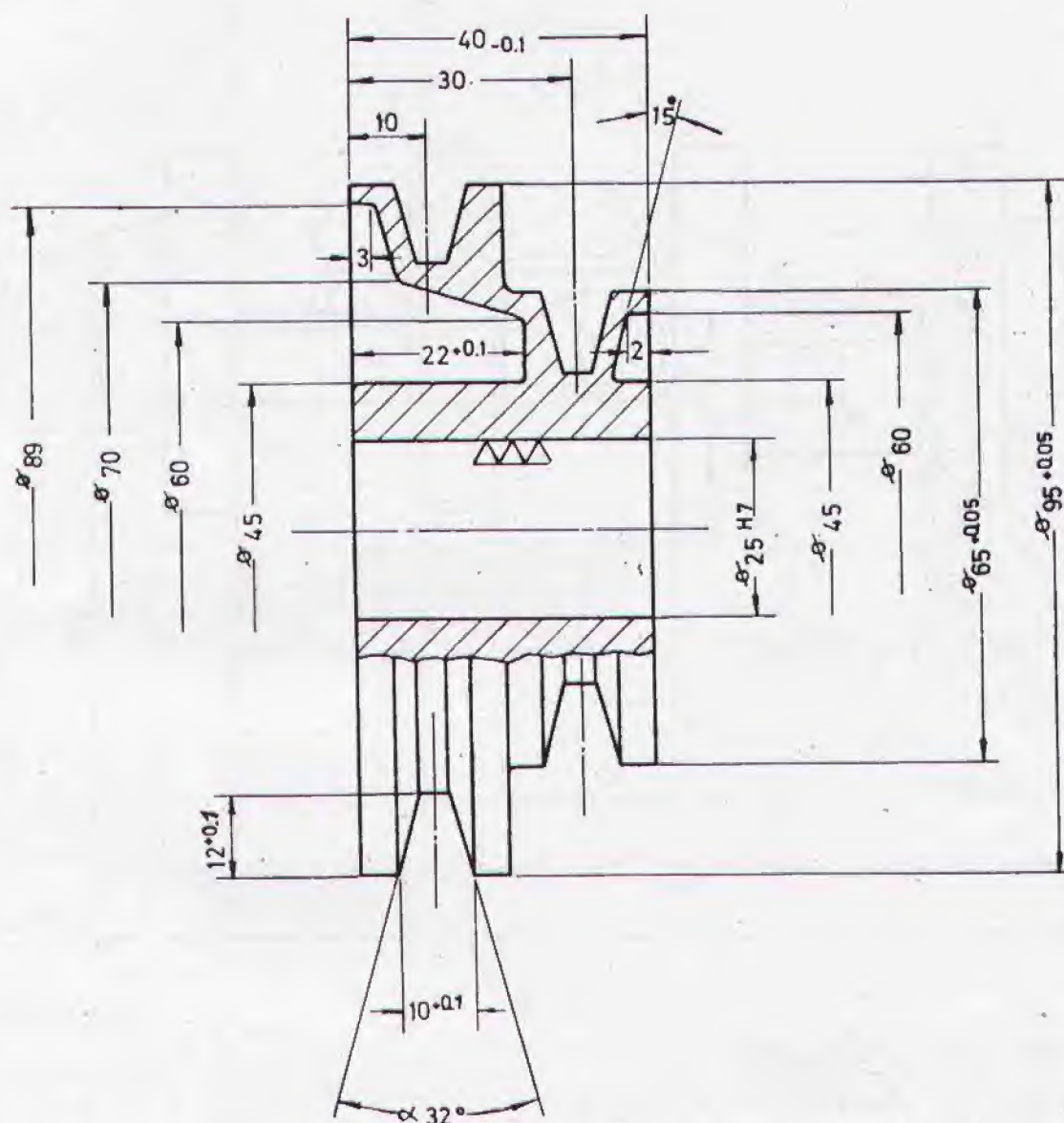
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

▽ (▽▽)

FOR ALL DIMENSIONS ± 0.1
UNLESS OTHERWISE STATED



Turn the outside diameter by using a mandrel to ensure true running.

25 H7 $\begin{matrix} +0.021 \\ 0.000 \end{matrix}$

SCALE 1:1

MAT: CAST IRON

PULLEY

MP/2.3/4.1.1/9

TURNING III

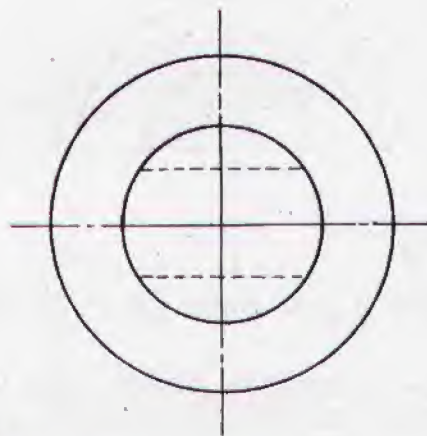


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

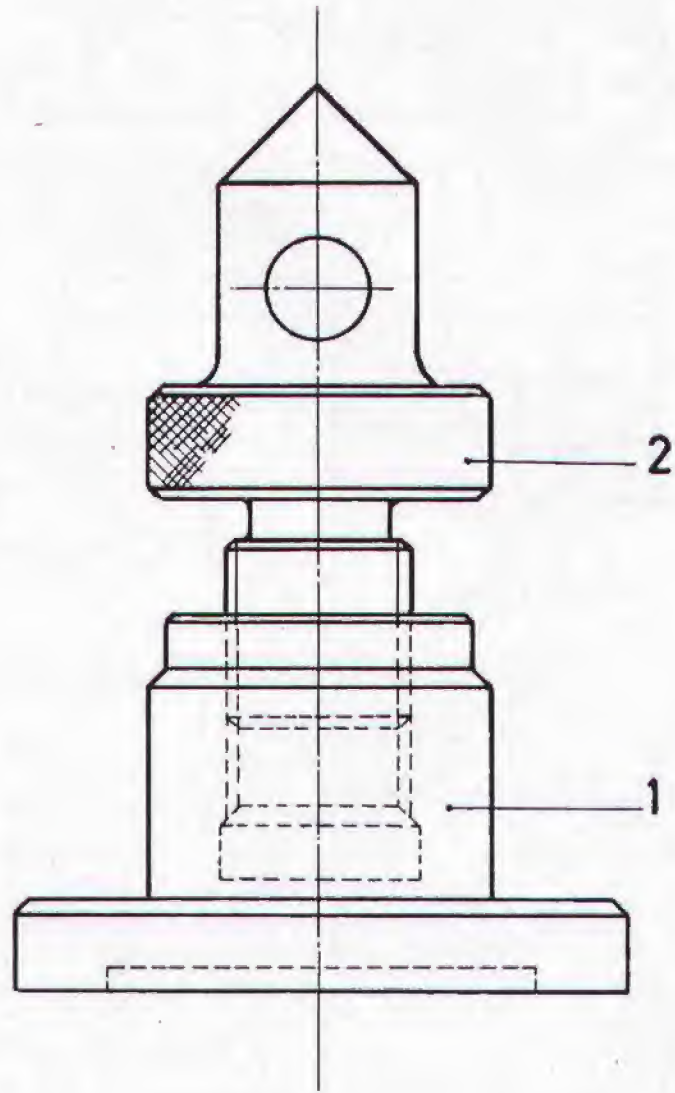
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

$$\nabla \nabla \quad (\nabla \nabla)$$

TURNER



SCALE 1:1

MAT: MILDSTEEL

BASE AND MOVEABLE SCREW

MP/23/4.11/12 a

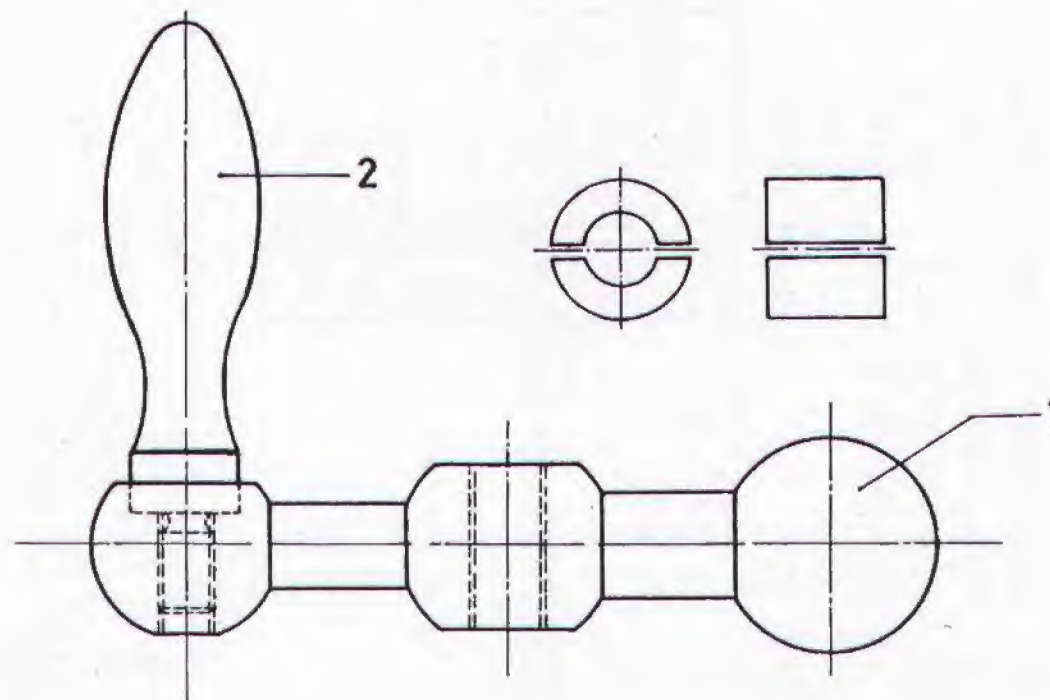
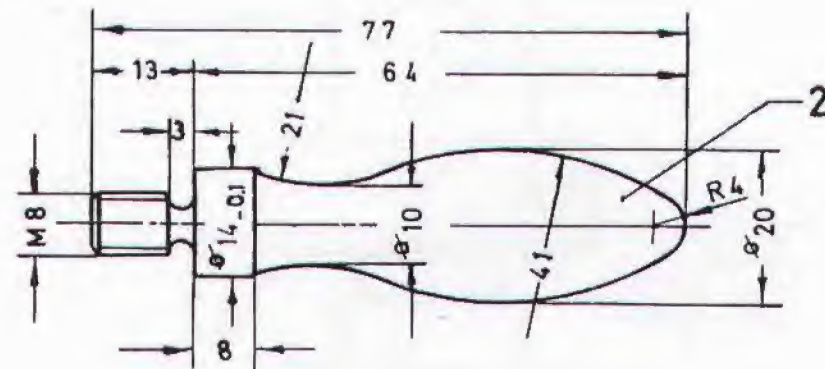
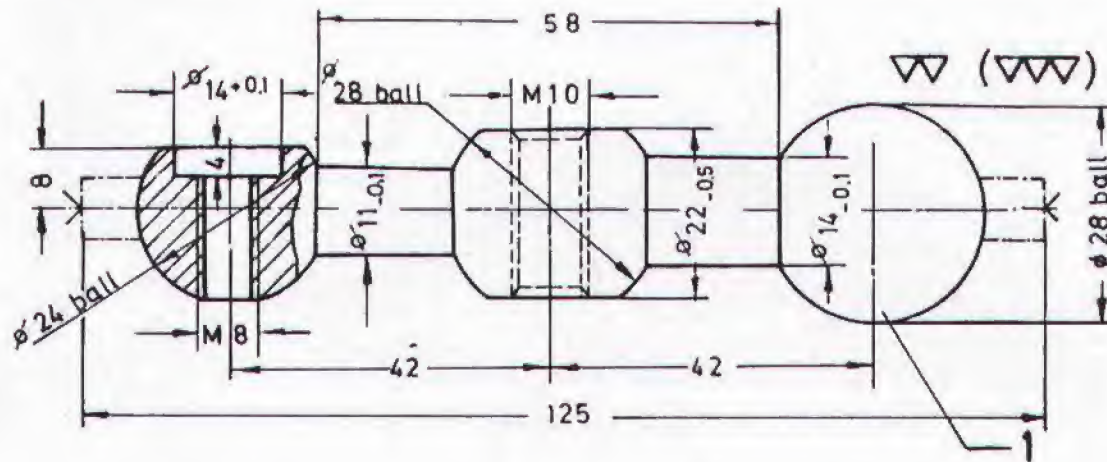
TURNING III



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



SCALE 1:1

MAT: MILDSTEEL

MACHINE HANDLE

MP/2.3/4.1.1/13

TURNING III

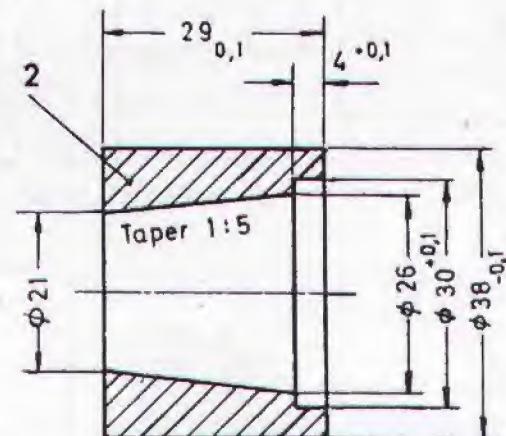



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

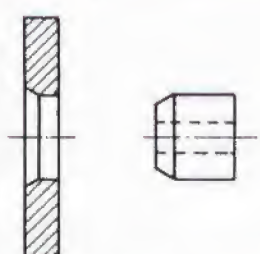



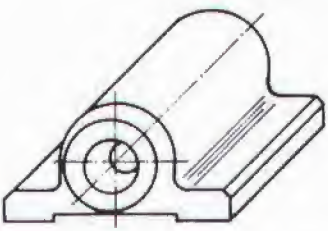
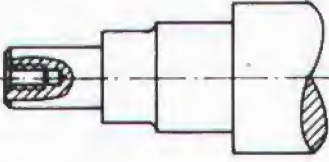

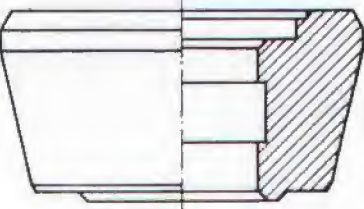

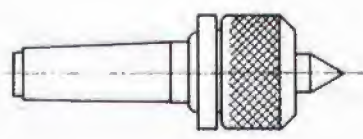
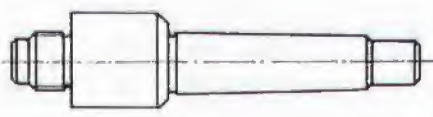
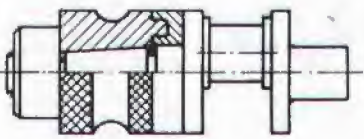
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER





SCALE 1:1	ECCENTRIC TAPER BOLT	MP / 23/43.1/15
MAT.MILDSTEEL		TURNING III
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		TURNER

 <p>Exercising of known operations</p> <p>1 → 3</p>	 <p>Turning within small tolerances</p> <p>2 → 5</p>	 <p>Turning of welded parts</p> <p>1 → 3 → 5</p>
 <p>Turning of internal grooves</p> <p>4 → 5</p>	 <p>Working on a four jaw chuck</p> <p>3.1.2/10 → 5 ← 2/3/4</p>	 <p>Work with steadyrest</p> <p>6</p>
 <p>Facing of grooves</p> <p>7</p>	 <p>Boring to high accuracy</p> <p>8 → 4.21/9</p>	 <p>Taper turning</p> <p>9</p>
 <p>Exercising of known operations</p> <p>10</p>	 <p>Exercising of known operations</p> <p>11 → 4.2.1/11</p>	 <p>Eccentric shaft</p> <p>12</p>
<p>In addition to the exercises shown above , the trainees have to make parts which are needed for the training centre.</p>		
<p>TRADE TRAINING III</p>	<p>LAYOUT</p>	
<p>DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING</p> <p>PAK-GERMAN TECHNICAL TRAINING PROGRAMME</p>		<p>MP/2.1/4.1.2 TURNING IV TURNER</p>

MATERIAL REQUIRED

TURNER

TRADE TRAINING III

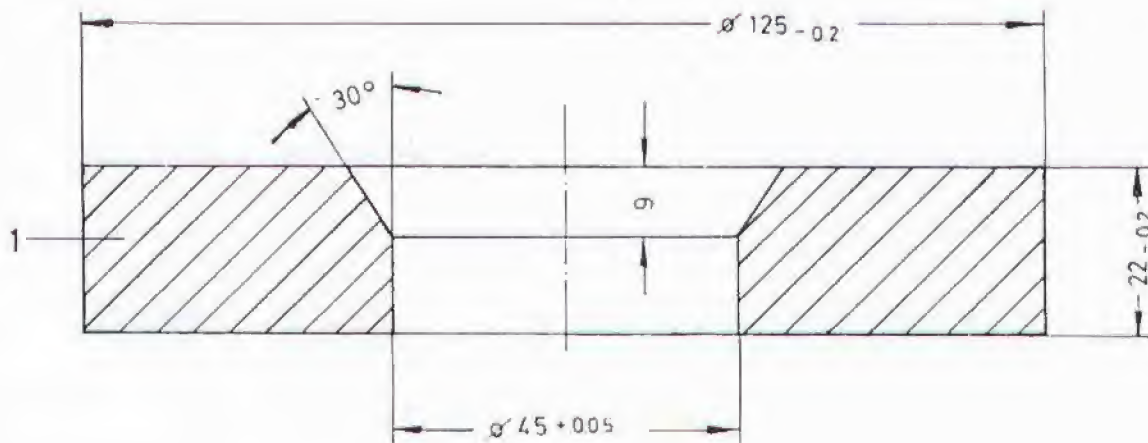
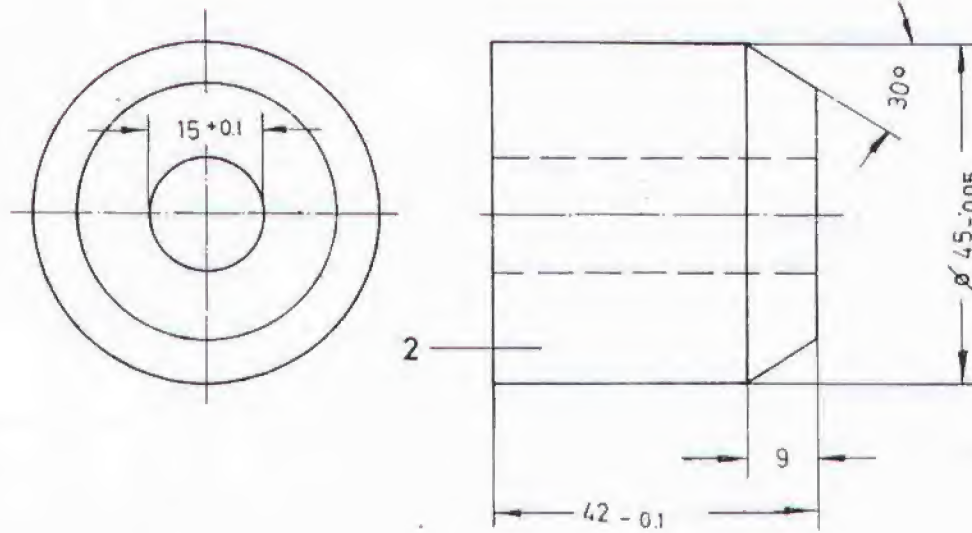
TURNING IV

No. 4.1.2/1 to 12/ Exercise No.

(Length given in Millimeter)

TURNING IV		Exercise No.												(Length given in Millimeter)												Length per Trainee	Total length for 16 Trainees	Total weight for 16 Trainees																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
No.	4.1.2/1 to 12	1,1	1,2	2	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25				26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
M.S.Round Ø 50 mm (2" DIA)		48				106										16																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

Tolerance ± 0.2



SCALE 1:1

MAT: MILDSTEEL

FLANGE

MP/23/4.1.2/1

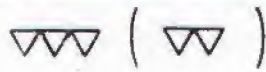
TURNING IV



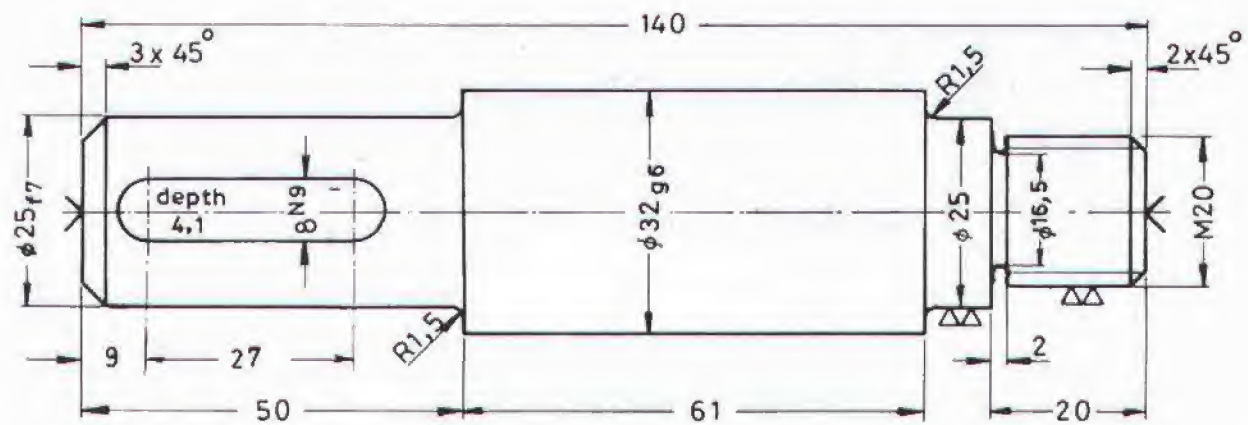
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Tolerance $\pm 0,1$
unless otherwise stated



25 f7	- 20 - 41
32 g6	- 9 - 25
8 N9	0 - 36

SCALE 1:1

MAT.: MILD STEEL

SHAFT

Mp/2.3/4.1.2/2

TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

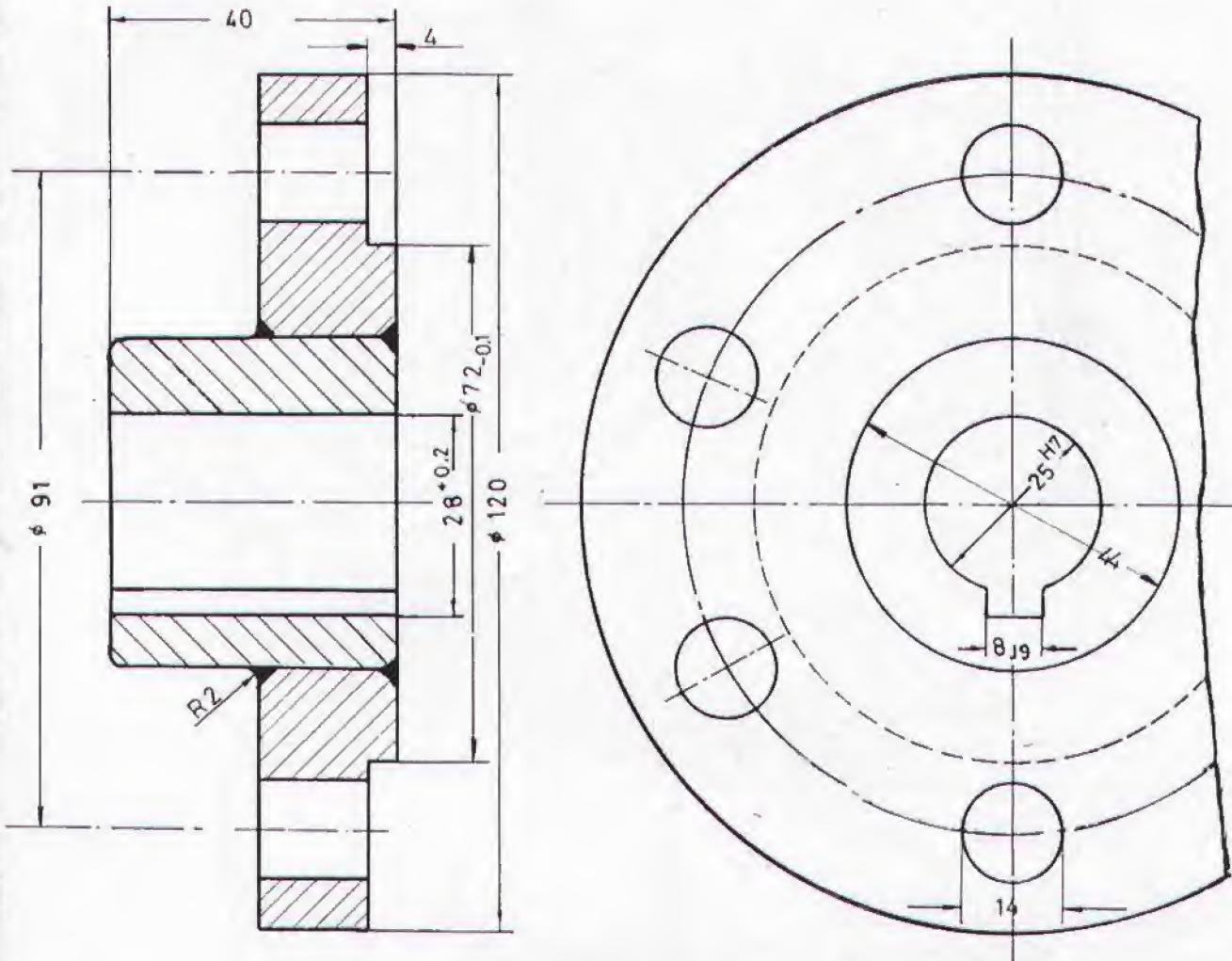
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Tolerance ± 0.1
unless otherwise stated.

65



SEQUENCE OF OPERATION

1. Hold workpiece on the rough machined $\phi 45$.
2. Machine the hole 25^{H7} , outside $\phi 120$ and step 72×4 .
3. Hold workpiece on a mandrel and finish the $\phi 44$.
4. Shape the keyway on a shaping machine.

SCALE 1:1

MAT: MILDSTEEL

From Ex.1

FLANGE

MP/21/4.1.2/3

TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

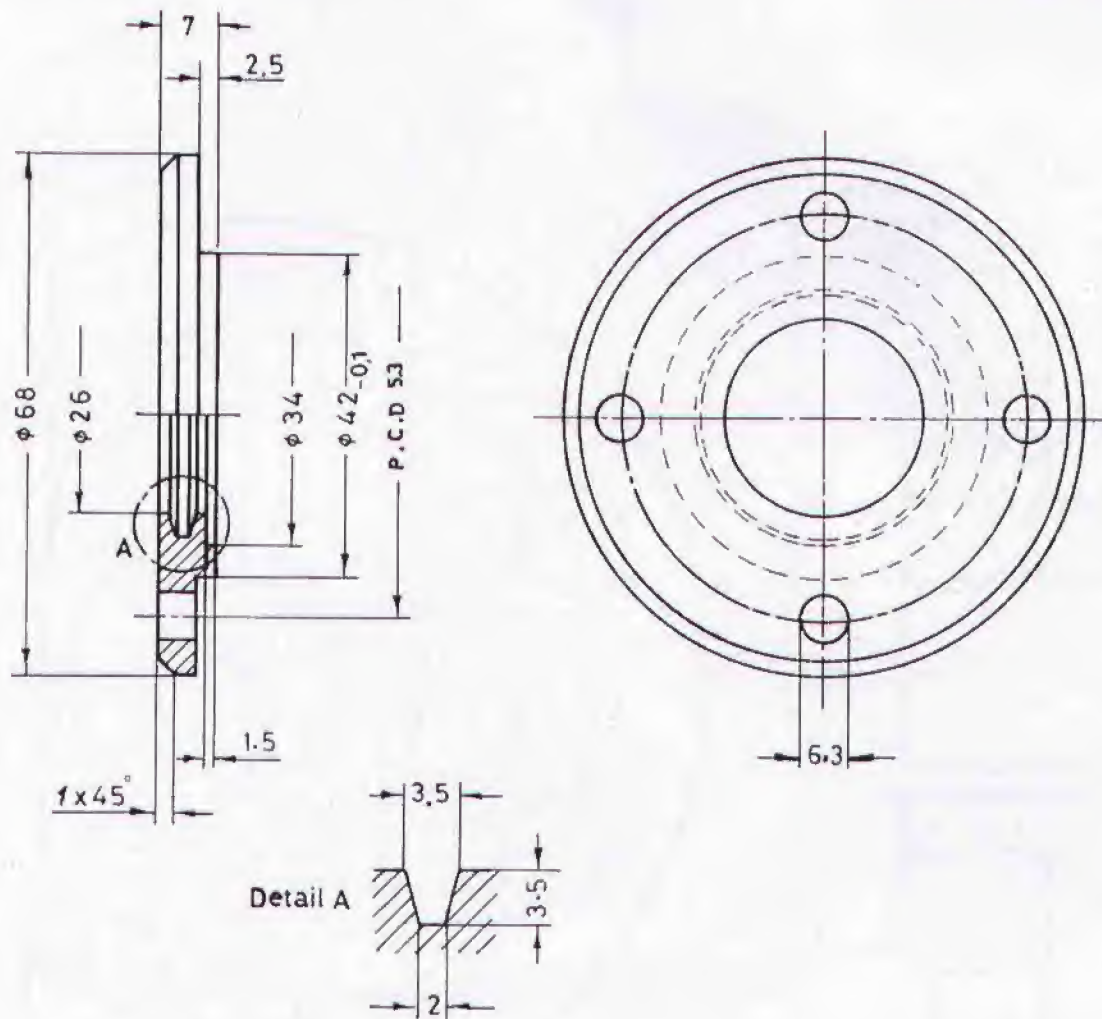
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Tolerance $\pm 0,1$
unless otherwise stated

66



SEQUENCE OF OPERATION

1. Chuck workpiece in three-jaw chuck.
2. Face one side.
3. Re-chuck, use distance bush to ensure parallel faces and face to thickness.
4. Turn step, drill and bore to $\phi 26$.
5. Turn internal groove.
6. Hold workpiece on a mandrel and turn outside diameter.

TOOLS

Bent roughing tool
Right hand side tool
Boring tool
Form grooving tool

SCALE 1:1

MAT MILDSTEEL

BEARING COVER

MP/2.1/4.1.2/4

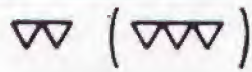
TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

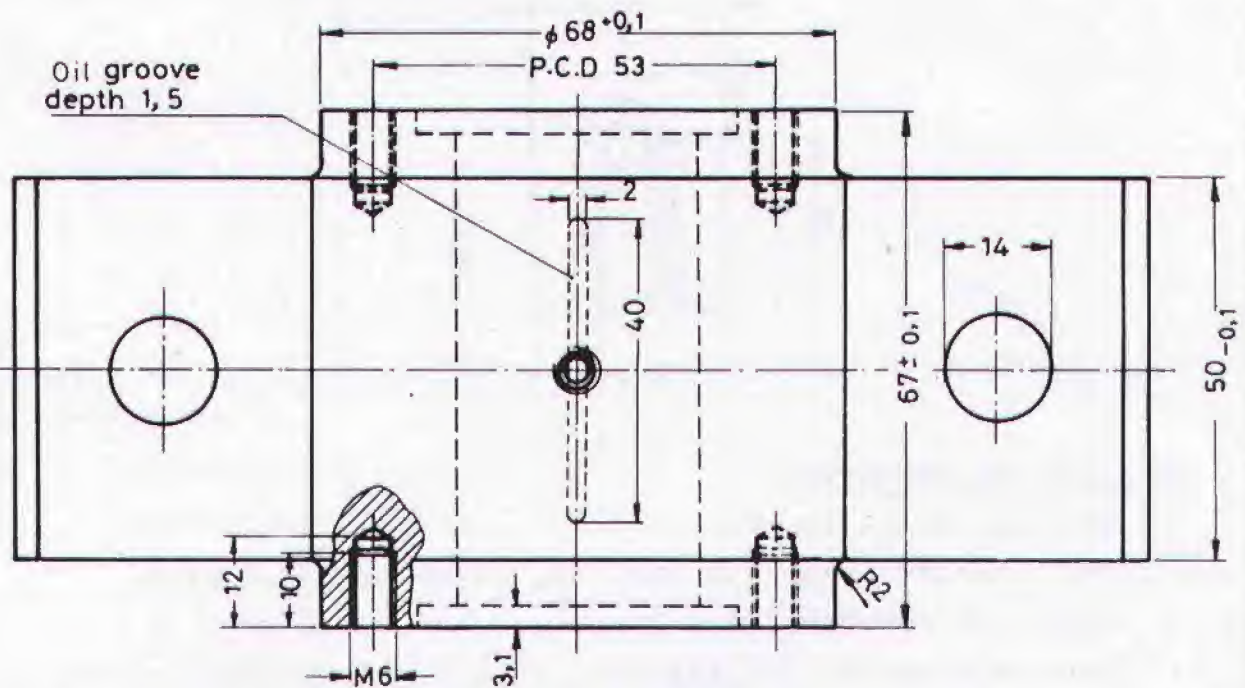
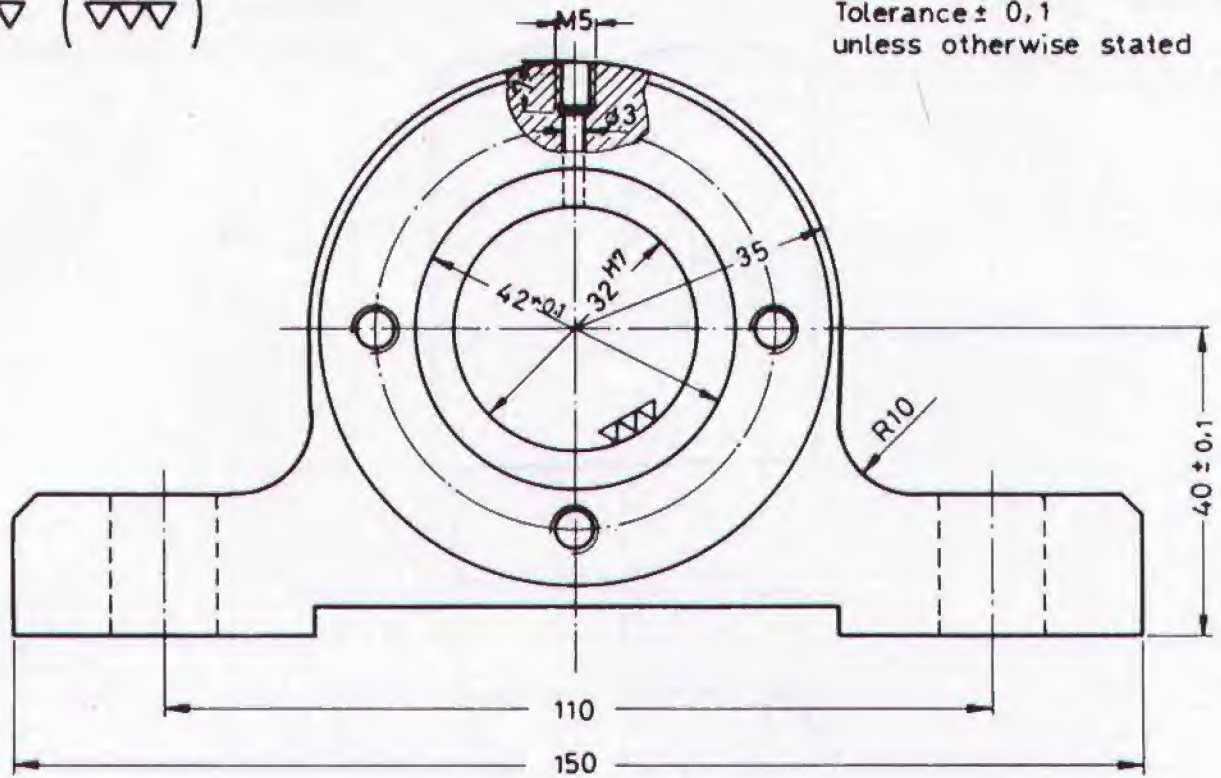
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



67

Tolerance $\pm 0,1$
unless otherwise stated



Note: Assemble the bearing with shaft ex.2, flange ex.3 and bearing covers ex.4
Check for smooth running.

SCALE 1:1

MAT. CAST IRON

CAST IRON BEARING

From 3.1.2/10

Mp 2.3/4.1.2/5

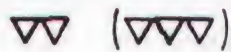
TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

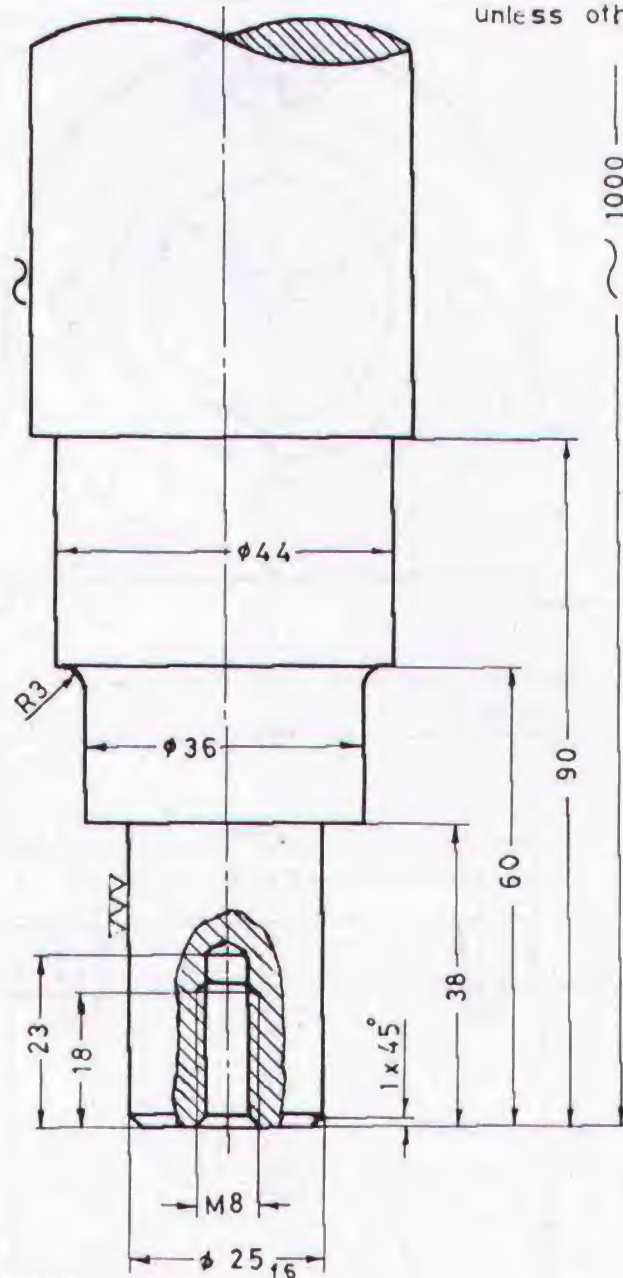
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



Tolerance ± 0.1
unless otherwise stated

68



25_{16}	-0.020
	-0.033

SEQUENCE OF OPERATION

1. Mark and punch centre.
2. Drill centre hole with the help of drilling machine.
3. Chuck and set the lathe centre.
4. Machine a groove for the jaws of the steady rest.
5. Set the steady and remove the lathe centre.
6. Machine to the required dimensions.
7. Part off to a length of 100 mm.

SCALE 1:1

MAT. MILD STEEL

SHAFT

MP/2.3/4.2/6

TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

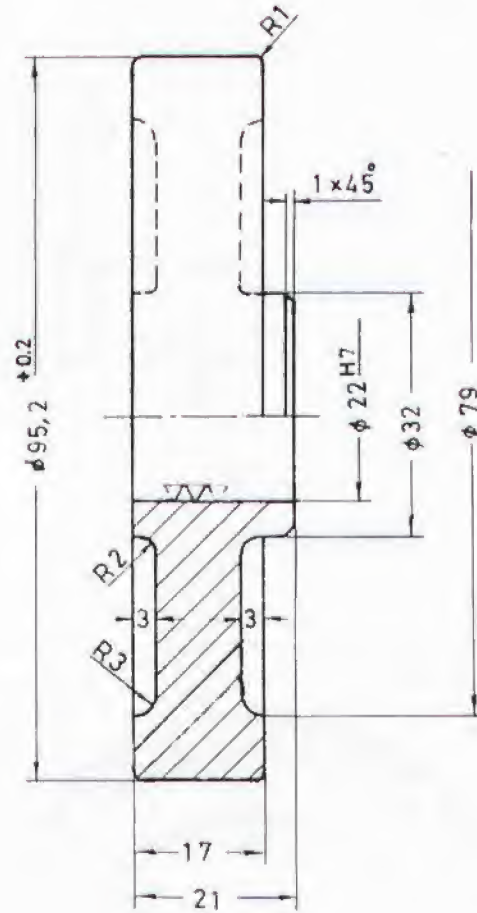
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

$\nabla(\nabla\nabla)$

Tolerance $\pm 0,1$

unless otherwise stated.



$$22^{H7} = \begin{matrix} +0,021 \\ 0 \end{matrix}$$

Check the hole 22^{H7} with a plug gauge.

SCALE 1:1

MAT CAST IRON

GEAR BLANK

MP/21/4.1.2/7

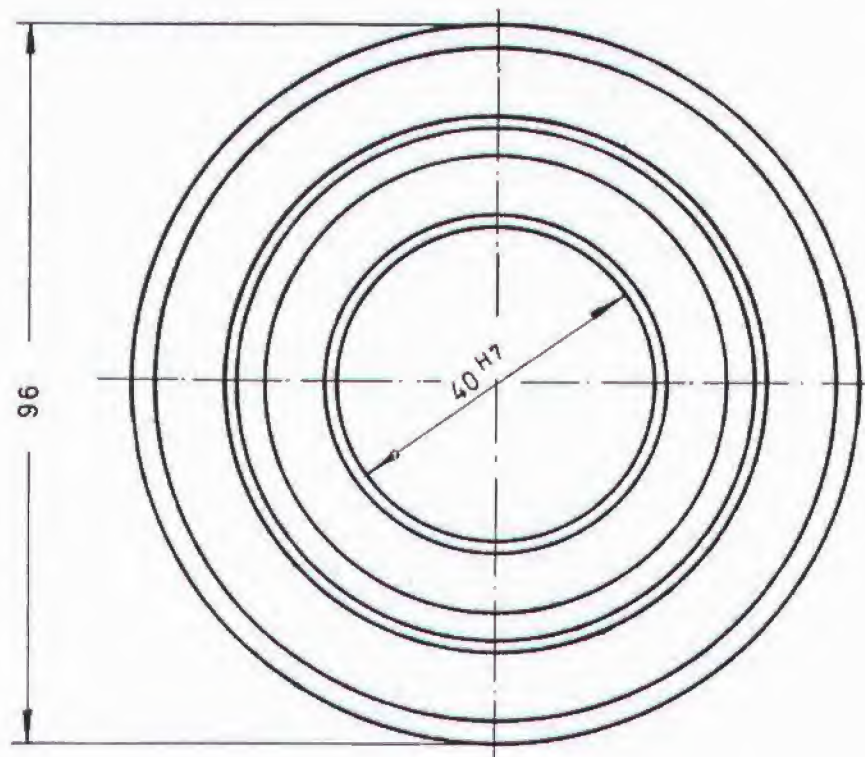
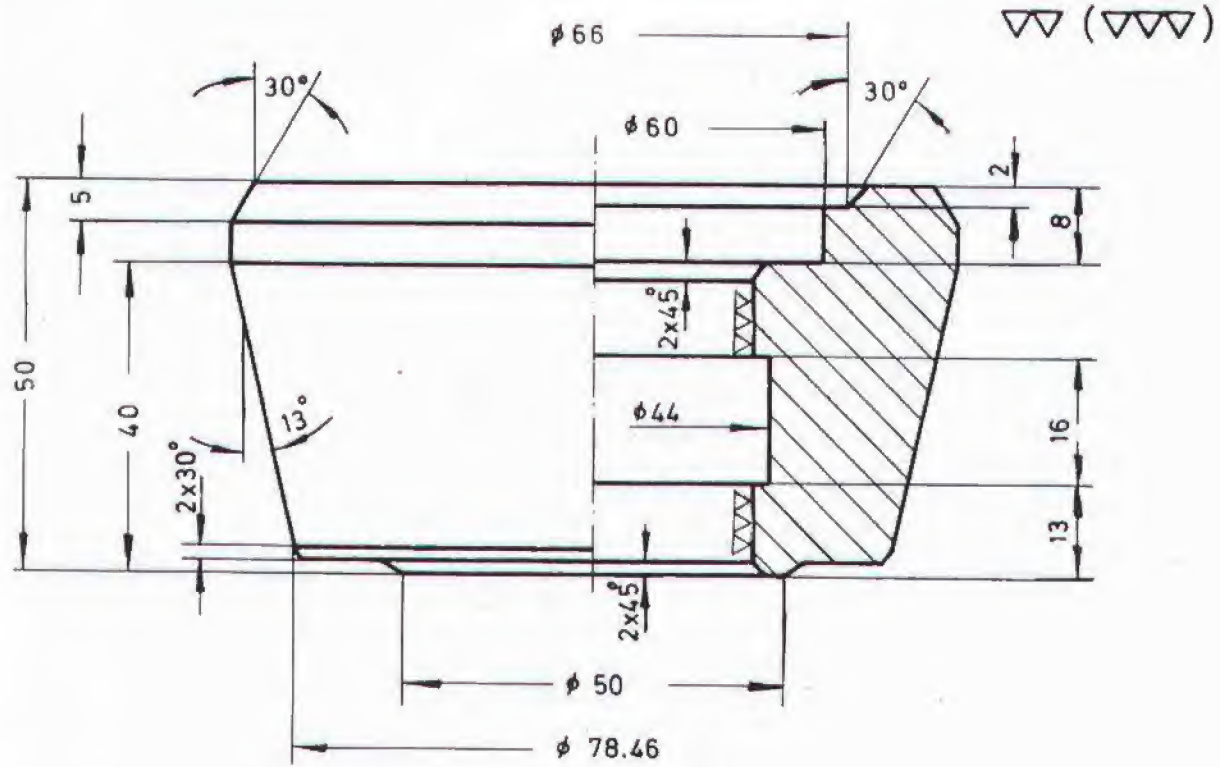
TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



SCALE 1:1

MAT: MILDSTEEL

MILLING HEAD BODY

MP/21/4.1.2/8

TURNING IV



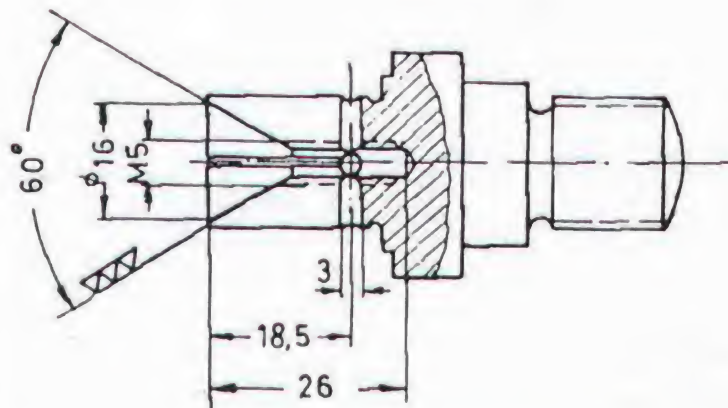
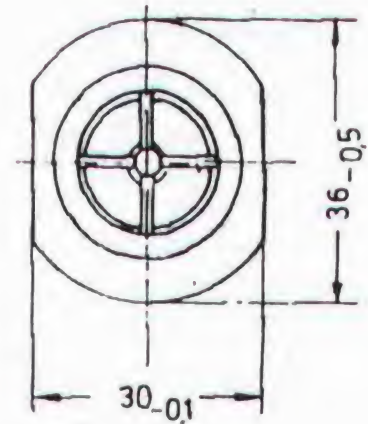
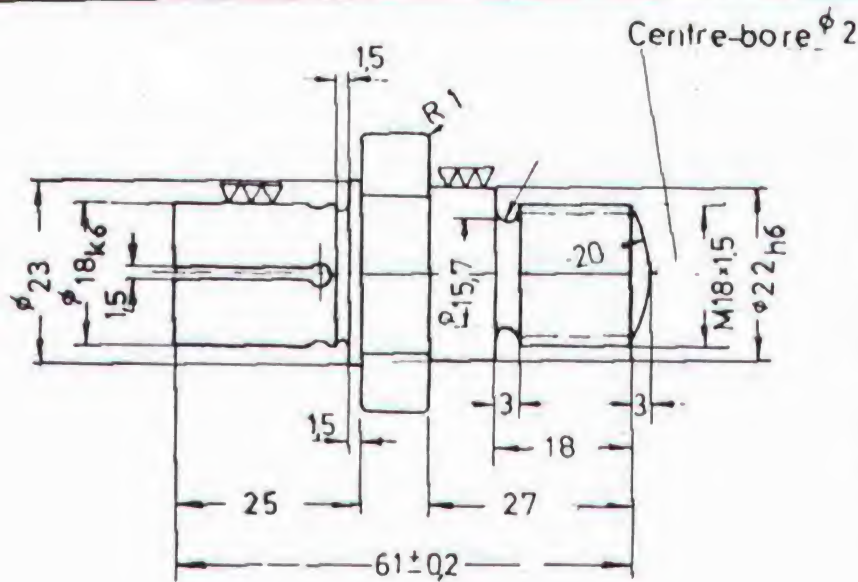
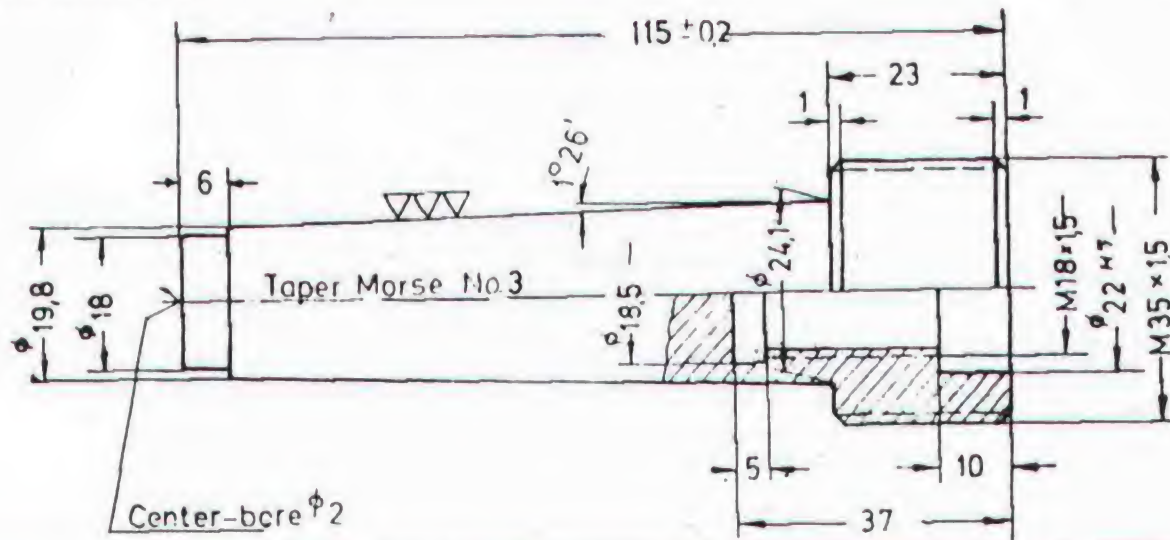
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

Tolerance $\pm 0,1$

$\nabla (\nabla \nabla)$ 71



$\phi 18 k6$	$+0,015$ $+0,002$
$\phi 22 H7$	$+0,021$ 0
$\phi 22 h6$	0 $-0,013$

SCALE 1:1

MAT. MILDSTEEL

PARTS OF
EXPANDING MANDREL

MP/2.1/4.1.2/9

TURNING IV

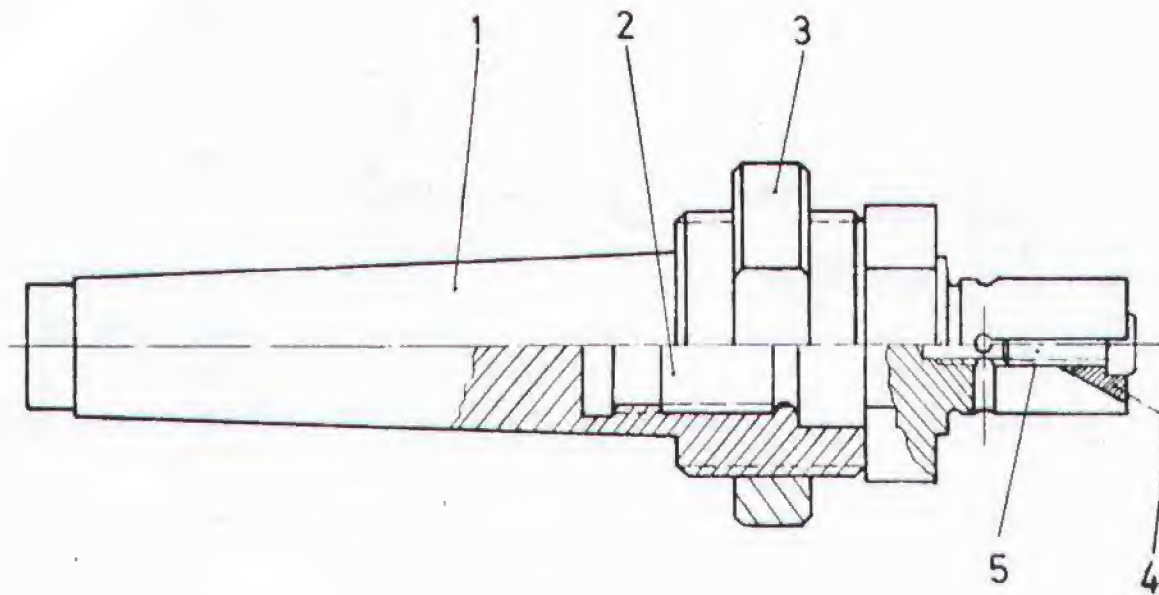


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

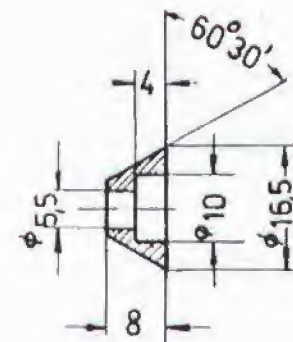
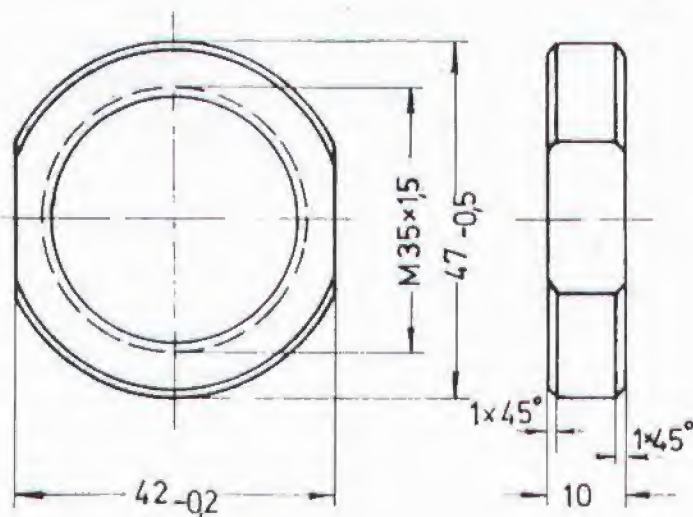
72



Thread acc. to part No.1

3

4



1	Cheese head screw	5		M5 x 15
1	Cone washer	4		
1	Forcing nut	3		
1	Mandrel	2		
1	Taper shank	1		
Qty.	Denomination	Part-N.	Materil	Remarks

SCALE 1:1

MAT MILDSTEEL

EXPANDING MANDREL

MP/21/4.1.2/9a


TURNING IV

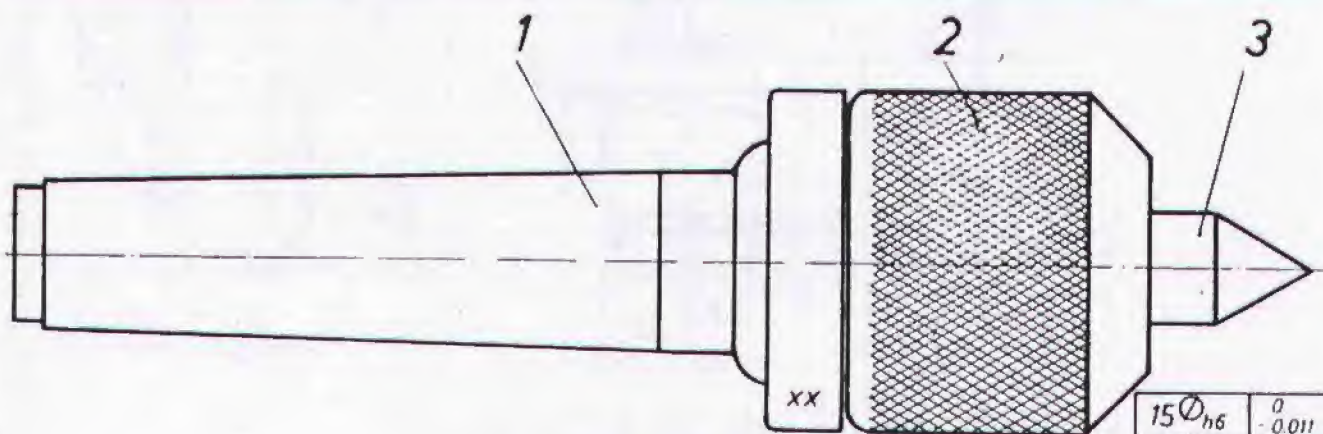
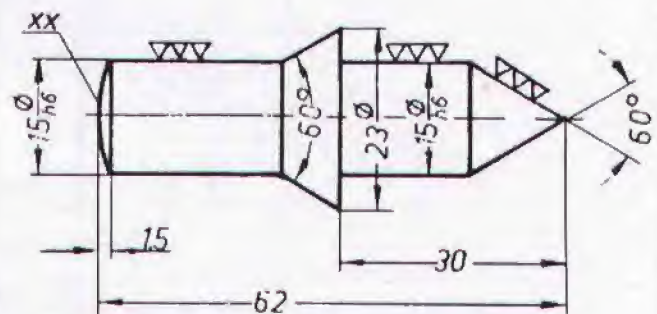
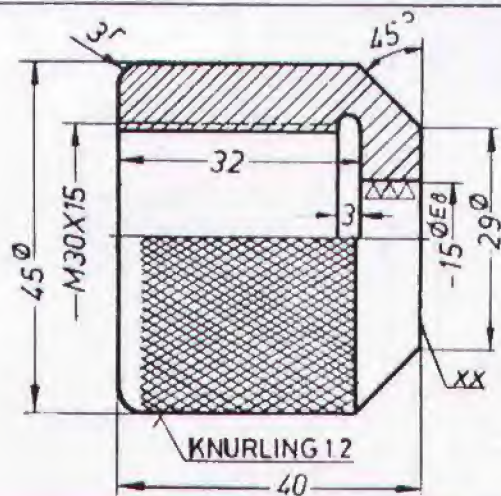
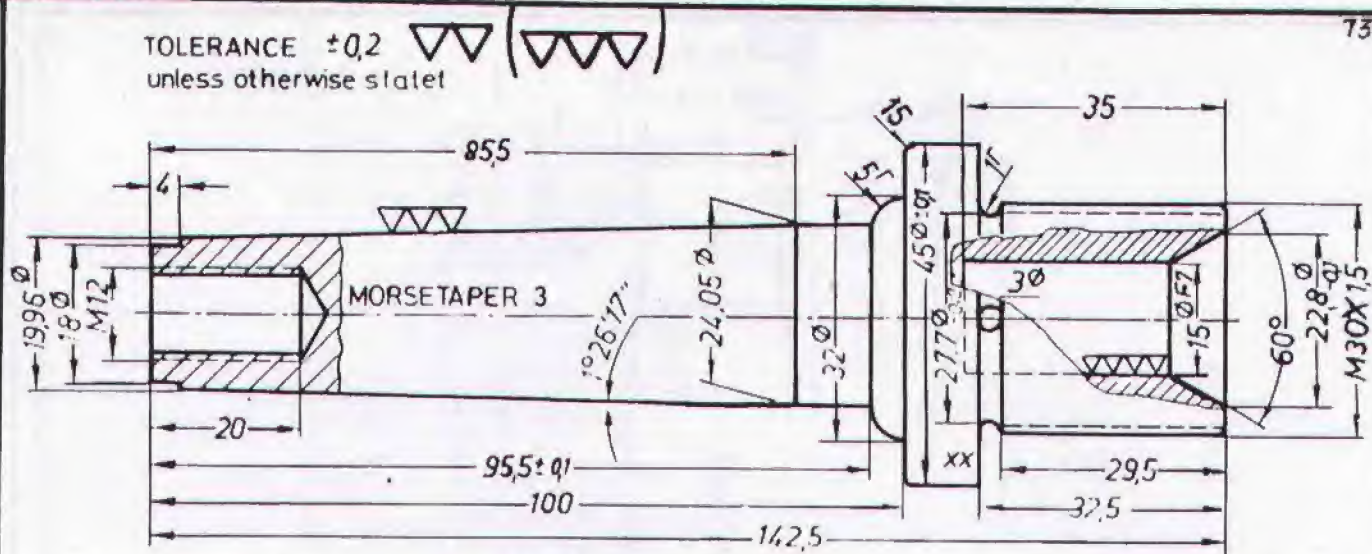


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER

TOLERANCE $\pm 0,2$ 
unless otherwise stated



15 \varnothing_{h6}	0 - 0.011
15 \varnothing_{E8}	+ 0.059 + 0.032
15 \varnothing_{F7}	+ 0.034 + 0.016

1	CENTRE POINT (HARDENED)	3	CARBON STEEL
1	KNURLED NUT	2	MILDSTEEL
1	TAPER WITH THREAD	1	MILDSTEEL
QTY	Denomination	Part No	Material

SCALE 1:1

MAT:

RUNNING CENTRE

MP/21/412/10

TURNING IV



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

TURNER



TURNER

